OF MICHIGAN
1952

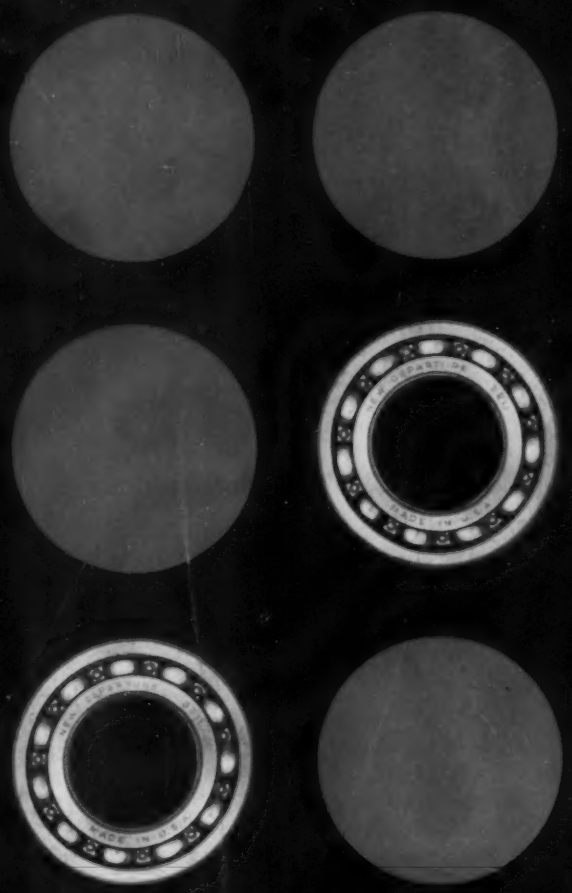
A CHILTON PUBLICATION

The Iron Age

E NATIONAL METALWORKING WEEKLY

January 31, 1952

ENTS PAGE 2



...and the Air Force should know!

Few products mean so much to so many industries.
That's what the Air Force meant when it described the Ball Bearing as "The Tremendous Trifle". New Departure makes a large share of them. We think we make the finest, too.

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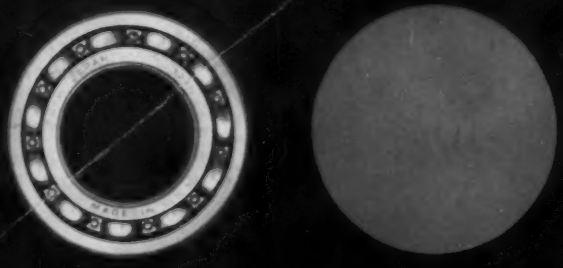
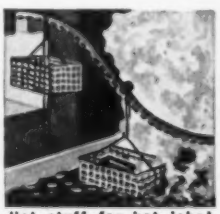


How many SPARKS in a Spark Plug?

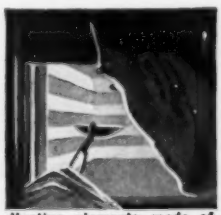
Surprising, the confidence that people have in spark plugs. No one stops to question how many "sparks" they're good for, because long-life performance has come to be taken for granted. Yet, when you get right down to it, you'll find good reasons for this complete consumer confidence. And, from a "sparking" point of view, perhaps the most important is the almost universal use of special Hoskins alloys for the vital electrode wires.

Producing the wire that sparks your car to power is a tough and tricky business. It requires special care in the selection of raw materials. Special melting and production techniques. Plus extremely close control over alloy composition and uniformity of quality throughout the entire manufacturing process.

Yet that's exactly the kind of alloy that Hoskins is qualified to produce best. For, among the other quality-controlled alloys developed and manufactured by Hoskins are: Alloy 717—for facing engine valves; Alloy 785—for brazing belts; Alloy 502—for countless heat resistant mechanical applications. Then, too, there are the Chromel-Alumel thermocouple alloys . . . guaranteed to register true temperature-EMF values within specified close limits. And, of course, Hoskins CHROMEL . . . the *original* nickel-chromium resistance alloy used as heating elements and cold resistors in countless different products.



Hot stuff for hot jobs! Hoskins Alloy 502 is ideally suited to many mechanical-structural applications.



Heating elements made of Hoskins Chromel deliver full-rated power throughout their long and useful life.

Chromel-Alumel thermocouple alloys accurately measure exhaust temperatures of jet aircraft engines.

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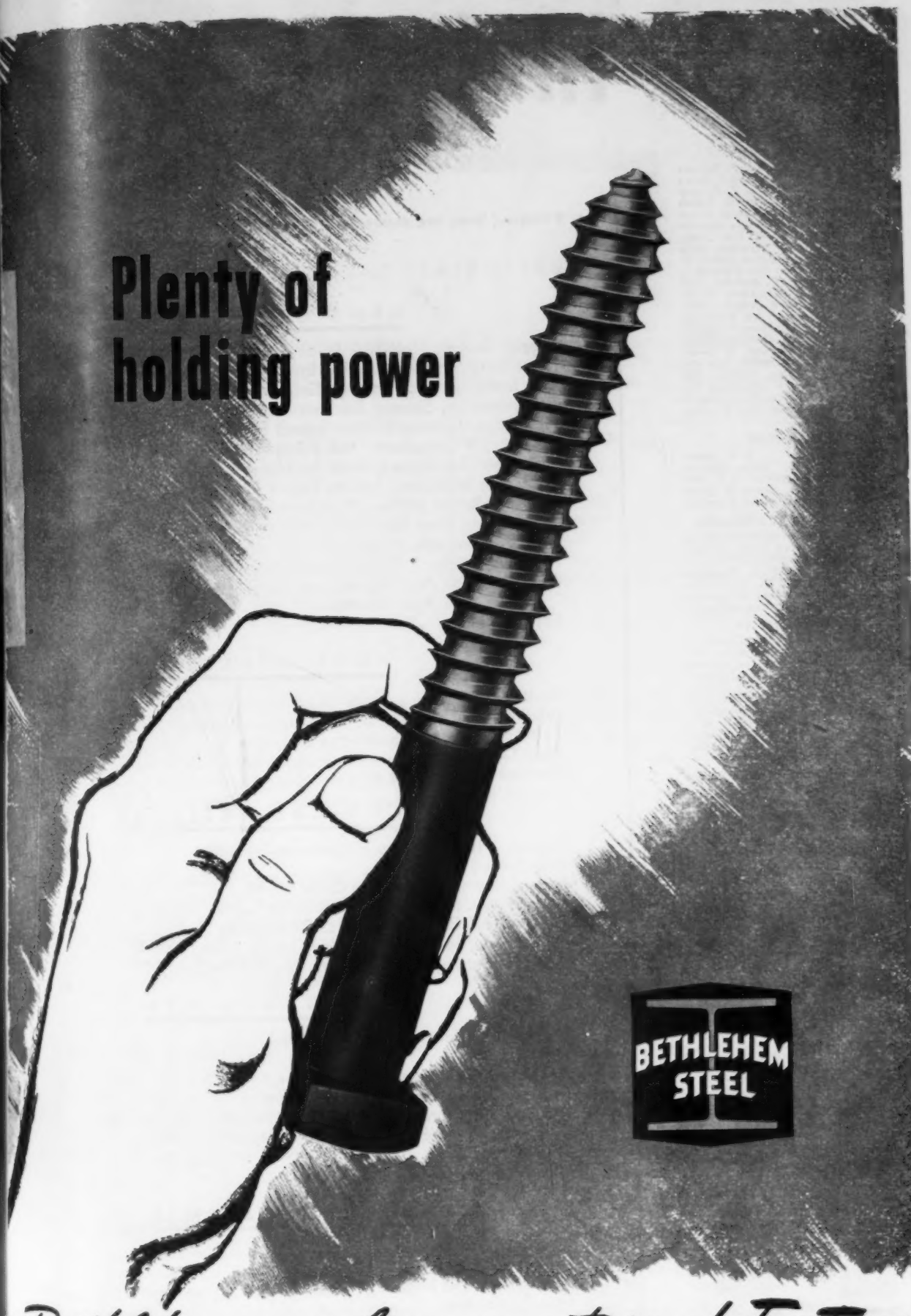

Bethlehem supplies every type of Fastener

IRON AGE

JANUARY 31, 1952
VOL. 169, No. 5

THE IRON AGE
Editorial, Advertising and Circulation Offices, 100 E. 42nd St., N. Y. 17, N. Y.

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One of the Publications Owned and Published by Chilton Co., Inc., Chestnut & 56th Sts., Philadelphia 39, Pa.

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Indexed in the Industrial Arts Index and the Engineering Index. Published every Thursday by the CHILTON CO. (INC.), Chestnut & 56th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 8, 1932, at the Post Office at Philadelphia under the act of March 3, 1879. $8 yearly in United States, its territories and Canada; other Western Hemisphere Countries, $15; other Foreign Countires, $25 per year. Single Copies 35c. Annual Review and Metal Industry Facts Issue, $2.00. Cable address "Ironage" N. Y.

Audit Bureau of Circulations

Society of Business Magazine Editors

Controlled Circulation Audit

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DIGEST

of the week in metalworking

PAGE 57 **STEEL TASK GROUP REPORTS ON EXPANSION**

An outline of future military needs, product by product, could help guide the pattern of steel expansion and make certain that no specific shortages develop when overall capacity is sufficient. This was one of the important conclusions of a detailed report submitted by a steel committee.

PAGE 60A **METALWORKING SURGES IN NEW ENGLAND**

Economy of most industrialized U. S. area shifting away from soft goods production. Hard goods industries are carrying the ball for the Yankee economy. Gains in this field are offsetting job losses in other industries. Taxes, union demands hurt. Machine tools show the biggest increase.

PAGE 60B **RAISE COPPER INGOTS FROM LAKE BOTTOM**

Around 1870 a 3-masted schooner carrying about 300 tons of copper ingots sank off Saginaw, Mich. So far salvage attempts have been unsuccessful but the need for this metal is so pressing that Salvage Skipper Julius F. Roth, aided by NPA officials, will make another try to rescue the ingots.

PAGE 61 **FONTANA MILL WRITES OWN SUCCESS STORY**

Industry no longer considers the Fontana mill a waste of oranges as it did a decade ago. Low cost pig iron production hit 921,752 tons in 1951, 40 pct over 1950, and steel output hit 15 pct over 1950 with 1,317,643 tons. Finishing mills added another record to this success story of the West.

PAGE 62 **PLAN NEW ILLINOIS GAS STORAGE FIELD**

About $500 million will be spent over the next 3 years to make supplies of natural gas more available to industry. A step forward in this costly campaign is the Herscher Reservoir projected as a gas storage field in northern Illinois. The gas reservoir may start operating for the 1953-54 season.

PAGE 63 **INSTRUMENT MAKERS' PRODUCTION HIGH**

Material shortages, limited facilities and shortage of suitable manpower are the tough obstacles to instrument makers. Deliveries are generally slow and many items are held up by lack of a single component. Competition is mainly technological with a greater variety of products resulting.

PAGE 80 **OLDS LANDS ON FEET WITH WAR CONTRACTS**

Oldsmobile is proving an exception to the rule that defense contract lag in the Detroit area is biting deeply into employment. Worker loss has been held within 10 pct. Olds has moved fast on contracts. No layoffs, but no rehiring. Employment may jump 25 to 35 pct before year's end.

PAGE 100 **CHAIN DRIVES IN POWER TRANSMISSION**

Roller and silent chain drives have useful application where positive drive with no slip is required. They are particularly useful on machine tools. Belt tension need not be high, which eases bearing wear. Chains for over-and-under drives, and variable speed chain units, are available.

PAGE 103 **METALLIZING PROTECTS FROM SALT WATER**

Aluminum and zinc sprayed on properly cleaned iron and steel and coated with rinyl sealers is effectively protecting steel fishing boats from salt spray corrosion. Maintenance costs are lower. Entire envelope of ships is sprayed during construction to protect hull and deck plates.

PAGE 112 **GETTING THE MOST OUT OF WATER SPRAYS**

The speed of quenching with water sprays depends on droplet size and the breakdown of the insulating steam layer around the steel. Variables studied indicate water sprays can be used to greater advantage to promote deeper hardening than is obtained with conventional flood sprays.

PAGE 139 **STEEL INVENTORIES ARE BADLY UNBALANCED**

Steel inventories are climbing. Many consumers report inventories of certain products straining at permitted limits. Many other products are badly unbalanced. Purchasing agents now face the task of bringing inventories into a state of better balance. Quick policy changes may be needed.

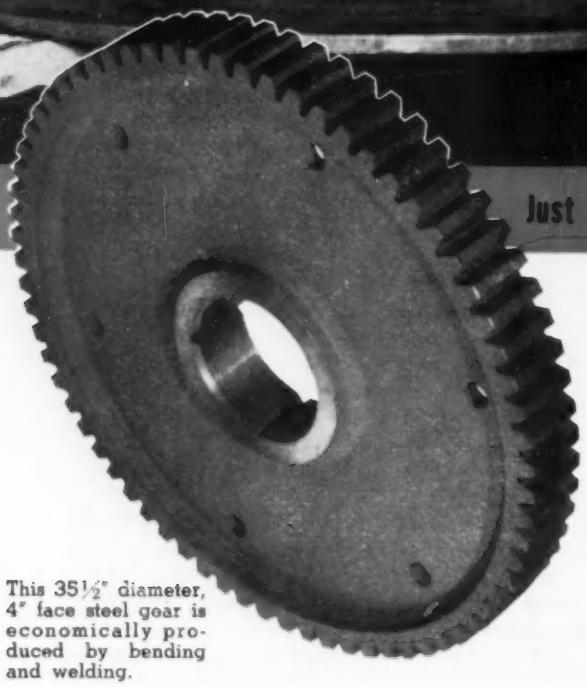
NEXT WEEK **NEW FORGING TECHNIQUES DEVELOPED**

Techniques have been studied for forging of aircraft outer skin panels. Parts are thin, and have integral stiffening ribs. Forgings thinner than 0.1 in. have been made, with draft angles as low as 1°. Areas of forgings are greater than conventional practice would indicate is possible.

GIANT GEAR RIMS

Wedge action die for bending rings in horizontal position. Removable inserts adapt this die for various diameters.

Just another job for versatile CINCINNATI PRESS BRAKES



This 35½" diameter, 4" face steel gear is economically produced by bending and welding.

This steel gear rim is completely formed from flat bar to ring in less than two minutes by repeated hits on a Cincinnati Press Brake.

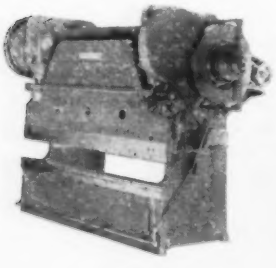
The wedge action dies require but little tonnage to bend this 2" x 4" hot rolled 35-45 carbon steel bar.

The great versatility of the Cincinnati Press Brake eliminates the need for an additional and highly specialized machine on this small-run job.

Low cost and quick changeover from job to job are among the factors that will make Cincinnati Press Brakes profitable in your shop.

Write for Press Brake Catalog B-3.

Contact our Engineering Department, who will suggest and advise on your production problems.



THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

The Iron Age
FOUNDED 1855

Some Day We Pay

KEEPING out of debt is not always easy. Take the case of a fellow who suddenly gets sick. He needs hospitalization, drugs and x-rays. While he is going through this his kids come down with a contagious disease and he has doctor bills galore.

This man finds his savings and much of his income will have to go to square accounts. There is no other way out. If his credit turns sour he can't get what he needs to feed and clothe his family. So he starts the long lonely haul. He cuts down and down and pays up until he is even again.

Somewhat the same situation applies to our national budget. There are cries that it must be cut. It will be cut but nowhere nearly so much as politicians are claiming that it should be. We have made a lot of commitments to hold back Communism. We have made commitments to people abroad and people at home. But domestic spending can and must be cut. Military requirements must be closely screened.

The new budget of $85 billion means that we will be in for a bigger deficit than ever before. Unexpended but appropriated sums so far this fiscal year are close to $73 billion—the carryover to 1953 fiscal year will be large. It is a safe guess that we are going to spend plenty in the next 2 or 3 years—without enough coming in to balance the budget.

Government and the people are the same. People have to pay their debts or lose face and credit. Government, sooner or later, must face up to the billions we are spending which we don't have. Some day—and it can't be too far away—we will have to take the long hard road to clearing off some of our deficit spending.

No matter how important it seems to spend to protect us from communistic encroachments we still have to pay the final bill. The alternative is printing-press money, loss of prestige and collapse.

If people looked at government as they look at their own personal affairs they might get a little excited about the future solvency of this country. Until they do this collectively, we are sitting on a powder keg at home as well as abroad. There is no easy way out of debt. Some day we must face that.

Tom Campbell

Editor

Little Things that Count Up....

36,000 FASTENERS OF EACH B-36 CALL FOR VARIETY OF SHARON* STEELS

The construction of an aircraft the size of the B-36 requires a large number of a great variety of fasteners, clamps and fittings. In fact, more than 30,000 such small parts are used in each plane.

Each of these parts must perform without failure regardless of heat, tension, vibration or the presence of corrosive atmosphere. The use to which the part is put dictates the type of steel from which it is made. Stainless, alloy, plain carbon and coated steel — used in the manufacture of countless thousands of these parts - is supplied by Sharon Steel Corporation.

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For information on Titanium Developments contact Mallory-Sharon Titanium Corp., Niles, Ohio

SHARONSTEEL

Dear Editor:

Letters from readers

Full of Facts

Sir:

We would appreciate it if you would pass along our most sincere congratulations to the people responsible for the "1952 Metal Industry Facts" appearing in your Jan. 3 issue. It is without a doubt the finest most concise report of its kind I have ever had the opportunity to read under one publication, and is most assuredly going to become a most used part of our reference library.

To people who deal in raw materials as we do, information of this sort is not only indispensable, but is not as readily available as you have made it in this report and we are grateful.

E. H. BRUMLEY
Brumley-Donaldson Co.
Oakland, Calif.

Resolutions and Predictions

Sir:

Have read your Jan. 3 editorial entitled "Resolutions and Predictions" and could not resist the urge to tell you that therein you have well said what needs saying. I have only one criticism—it should have been on the front cover to make sure that all subscribers read it.

E. B. ALDERFER
Industrial Economist
Federal Reserve Bank of Philadelphia
Philadelphia

Good Analysis

Sir:

We like Mr. Woldman's analysis of steel specifications published in your Jan. 3 issue but hope for a supplement listing JAN specifications.

R. G. SARTORIUS
Metallurgist and Engineer of Tests
National Lock Washer Co.
Newark, N. J.

We are going to take up the matter of JAN specifications with Mr. Woldman and it is possible that we may run a page on them.—Ed.

More Coke

Sir:

In the chart "U. S. Coke Capacity by Companies" on p. 398 of your Jan. 3 issue we find an error in the listing of our coke capacity.

The figures shown are for our Everett plant only and do not include the ovens and capacity of our Philadelphia and New Haven coke plants. The totals for our three plants are 348 ovens and an annual capacity of 2,120,000 net tons. All are byproduct.

In view of the high regard which we know readers have for the accuracy of your statistics and also because of the widespread usage of this information which you publish, we hope it will be possible to have a correction made of these figures.

C. E. DOWNING
Manager Public Relations
Eastern Gas & Fuel Associates
Boston

We show only capacity connected with iron and steel production.—Ed.

New Chrome Carbides

Sir:

There is an item on the Newsfront page of your Jan. 3 issue regarding the new chrome carbide in chemical service. Where can I get additional data on the use of this material for pumping equipment?

G. B. EMENY
Deming Co.
Salem, Ohio

Further information may be obtained from Carboloy Co., Inc., Box 237, Roosevelt Park Post Office, Detroit 32, Mich.—Ed.

Reducing Sulfur

Sir:

I have been told that you recently published an article concerning the use of nitrogen and lime to reduce the sulfur content of openhearth steel, a technique being used at the present time by one of the Canadian steel producers. When did this appear?

J. W. CALDWELL
Industrial Engineer
Standard Steel Works Div.
Baldwin-Lima-Hamilton Corp.
Burnham, Pa.

The article was "Ridding Steel of Sulfur" which appeared on p. 213 of our Jan. 10 issue.—Ed.

Steel Parts

Sir:

Referring to the Newsfront page of your Dec. 13 issue, who makes the controlled density steel parts?

W. W. McKAIG
President
Cumberland Steel Co.
Cumberland, Md.

Write to P. E. Cavanaugh, assistant director, Ontario Research Foundation, 43 Queens Park, Toronto, for more information.—Ed.

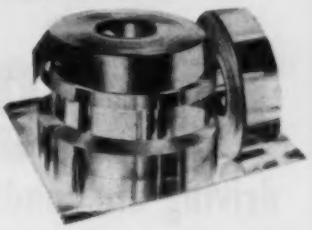
Clarified

Sir:

There has been a slip-up in the editorial comment heading the article "Step Quenching, Hot Peening Improve Lean Alloys" which appeared in your Dec. 27 issue. The hardness reported there should have read 84.4 Rockwell A rather than 84.4 Rockwell C.

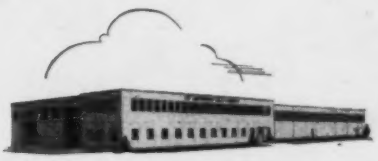
R. F. HARVEY
Metallurgist
Brown & Sharpe Mfg. Co.
Providence

LET'S TALK FLAT ROLLED STEEL PRODUCTS



Specializing in flat rolled metal products assures you a greater than usual interest for requirements in this range. Kenilworth's modern equipment and facilities are geared for almost instant service when order processing begins. So, when you have a need for spring steel (annealed or tempered), stainless sheets or coils, tin coated steel, shim steel and other flat rolled products, try Kenilworth first.

LET'S TALK ABOUT SUPPLY



Today's controlled and critical supply may be hurting you more than necessary. While our inventory varies, from day to day, it may be possible to assist you with your very need now. You can be certain you will get immediate and interested attention with an instant response of current availabilities.

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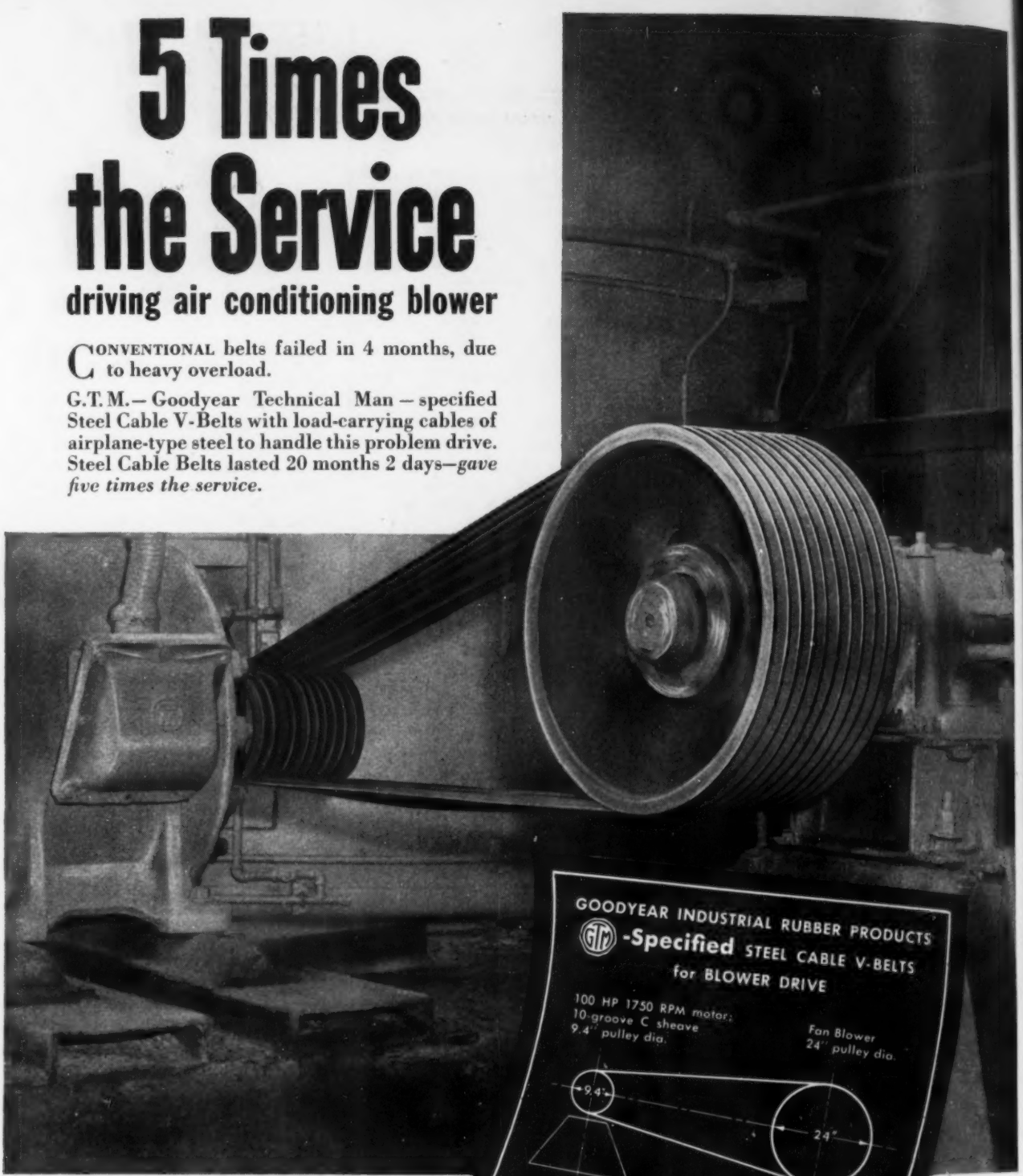
G.T.M.— Goodyear Technical Man — specified Steel Cable V-Belts with load-carrying cables of airplane-type steel to handle this problem drive. Steel Cable Belts lasted 20 months 2 days—*gave five times the service.*



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The Iron Age
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THE IRON AGE Newsfront

► Frequently heard today is the remark that Russia has no bomber with enough range to permit it to hit a U. S. target and return to its base. Nevertheless some defense officials are concerned because the Soviets may not hesitate to send bombers on one-way trips.

► From the President's budget message it can be seen that while many military programs are being pushed backward the atomic energy timetable is being advanced. This is true not only of weapons but also of atomic energy power plants.

► Overlooked when comparing defense material costs vs. civilian goods production costs: With efficient high production manufacturing operation, non-productive costs may run 15 to 20 pct of direct production costs. However, on many defense projects the non-productive expense may hit 50 pct of the total. A large part of the added expense is accounted for by inspection designed to protect the quality of the products of a wide range of contractors and sub-contractors.

► Auto engineers are answering critics of their more powerful new engines by saying that higher horsepower is incidental, not an objective, of the new power plants. Their basic objective is to provide more zip between 50 and 70 mph. Gasoline economy is still about the same or a little better--largely as a result of a change in axle ratios.

► X-ray inspection of cast armor tank hulls is now set up as standard practice. A Betatron is used which takes about 2 hr to complete the 22 million-volt X-ray inspection on each hull.

► Over 200 machine tools and about 600 jigs and dies will be made available shortly to Air Force prime contractors. Availability of these tools is a result of the cancellation of Fairchild Aviation's contract for production of C-119 cargo planes. These planes were to be made at the former Douglas plant at O'Hare Field in Chicago.

► The labor shortage aggravated by increasing military demands is causing more midwestern manufacturers to look toward the displaced person program as a source of skilled workers. Not too receptive 6 months ago, manufacturers are now making inquiries at the rate of ten to 15 companies per month for die casters, tool makers and other skilled labor.

► Metallurgists are wondering why the question of classifying as "secret" the use of rare-earths in metals. Most experts believe it is not a classifiable subject but one that industry should know more about. The issue is ballooning all out of proportion to the basic facts--the horse has been out of the barn for some time anyway.

► The use of oxy-natural gas burners for heating hot tops has increased ingot yields by about 10 pct. Eight steel producers are testing the process and a few have adapted the practice in ingot sizes up to 21 in. sq. Latest improvement in the method is that the burner top need not be water cooled.

► The use of mercury lamps for industrial lighting, indoors as well as out, doubled in 1951. Even greater growth is expected this year as more of the new mercury-fluorescent units, which don't have the objectionable blue-green light, are available.

the truth about Dow Corning Silicones...

. . . is more fantastic than the patter of the pitchman or the spiel of the barkers that doubled in advertising and sales a generation ago. For example:

- Silicone (Class H) electrical insulation makes motors and other kinds of electrical equipment last 10 times as long as they ever did before.
- These same insulating materials are used to double the power per pound ratio in electric machines.
- Silastic,* the Dow Corning silicone rubber is used to seal hot air at 600°F., hot oil at 350-400°F., limit switches and bomb bay doors at —100°F.
- Dow Corning Silicone oils and greases make permanent lubrication a practical reality.

To many engineers and executives, such silicone facts as these still sound too good to be true. That's why we have built and assembled 16,000 pounds of demonstration units and typical applications to prove that our silicone products will do all that we claim for them. This is the first comprehensive Silicone Exposition ever assembled. Previewed in Washington, D. C. during the week of October 22nd, this exhibit will be given private showings in major industrial centers across the country.

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now scheduled for

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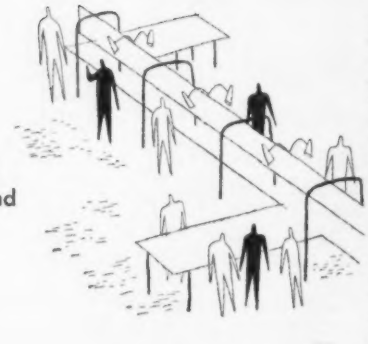

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STEEL: "Military Must State Its Needs"

The growing pains of the steel industry sprouting millions of tons of new capacity under the stress of rearmament's overload on production could be eased by stating specific military needs to guide expansion. It is not safe to assume that overall steel supply will meet any demand without product by product planning of military needs over long production periods. So far this information on specific needs has not been adequately available. It leaves future steel supply vulnerable to shortages of individual products.

This was one of the important conclusions outlined in a report submitted by a Steel Task Group to Defense Mobilizer Charles E. Wilson. Manned by 36 experts in the metals field, most of them in steel, the group was headed by Hiland G. Batcheller, chairman of the board of Allegheny Ludlum Steel Co.

The Task Force took its job seriously. It turned the spotlight on raw materials, supply, military needs.

Their problem, appraising the all-around sufficiency of coming giant steel production, was an all-important one not only to the steel industry—but to the people who use steel. The military is rapidly becoming a major consumer. Yet the services have not yet sat down to plan fully the types of steel they will need.

THE IRON AGE presents the Steel Task Group's report on the state of steel industry expansion. With little preamble the 36 experts comprising Steel Task Group named by Defense Mobilizer Wilson delved into the complex problems of raw materials supply, expansion, and requirements. The report follows:

"With reference to the over-all problems related to an adequate supply of steel for the future, we strongly urge that you give the following recommendations your utmost consideration to assure integrated and realistic programs.

"If planned facilities are to produce from 118,000,000 to 120,000,000 ingot tons of steel, an adequate supply of raw materials is obviously essential. We recommend, therefore, that:

"1—In order to supplement the diminishing supply of domestic high grade ore, action be taken to aid in every way possible programs now under way to beneficiate low grades of ore (Taconite and others) so that they may be utilized economically and, further, that encouragement and aid be extended to those who are undertaking aerial surveys with the aid of the magnetometer and gravitometer, with the objective of locating possible new deposits of domestic ore. Any favorable results from such projects would reduce our dependence on foreign sources in case of a large scale Global War.

"2—Continued effort to increase the supply of scrap necessary for sustaining steel production by historical pattern, and also a complete study to more accurately determine the availability of scrap for this purpose, and to provide for any possible deficiency by supplementing presently recognized sources of metallics by every means possible.

Hiland G. Batcheller

"3—New sources must be developed to provide additional manganese, a primary requisite for total steel production, for which there is little assurance that adequate supplies will be available from present sources for either current requirements or future needs;

"4—The supply of alloys and coating materials should receive continuous vigilance due to their strategic importance, the great dependence on foreign sources and the necessity to create adequate stockpiles for a future emergency. We are well aware of the fact that much constructive work is being done in the various Government agencies in regard to the supply of alloying elements. We feel this effort should be encouraged and

expanded, particularly in the following respects:

"(a) To study and recommend all possible means of increasing domestic production and the importation from other countries of those alloying elements which are in short supply.

"(b) To study the present stockpiling program and to evaluate the present production needs of the industry against the available supply of materials and to direct such changes in the present program as may be necessary.

"(c) To consolidate the studies of the various technical committees assigned to the problems of conservation and substitution of these materials, and to support such recommendations as may result. This part of the program should be along lines that resulted in the development of the National Emergency grades of steel during World War II.

"5—In connection with the importance of iron ore and alloying materials from foreign sources, it must be emphasized that interference in the delivery of these increasingly important foreign tonnages, as occurred in the last war, could vitally affect the maximum production of steel in this country. Protective measures are obviously the responsibility of the military authorities.

Steel for military requirements

"We have expressed our opinion that the expansion program of the industry, as now planned, will provide steel capacity on an *over-all* basis sufficient to meet military programs, as presently defined, with a substantial surplus available for other purposes. We particularly call attention, however, to the possibility of serious delay in the production of one or more of the weapons of war, in case there is an unexpected military requirement for any *individual* steel product.

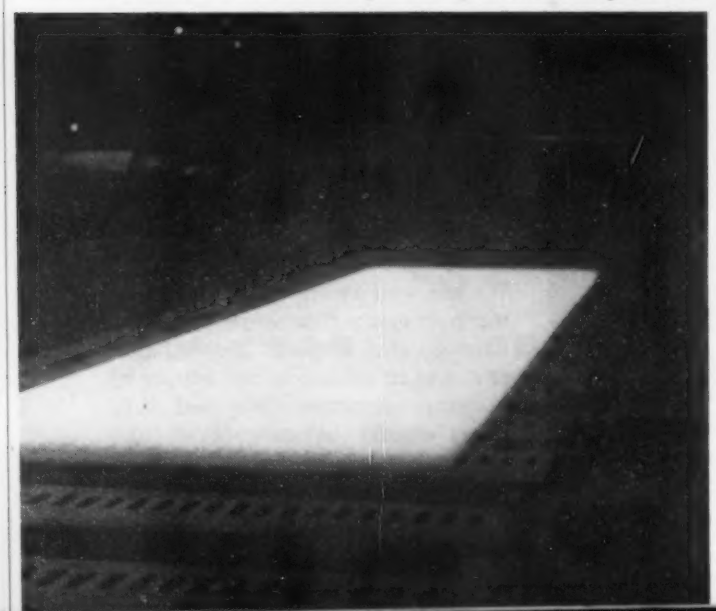
"The pattern of finishing facilities, as now scheduled, is largely the result of judgment on the part of the managements of the various producers. We strongly recommend that these finishing facilities be reviewed to establish their relationship to military programs, and we further recommend that the industry be kept currently informed during the development of long-term military programs, in order that appropriate adjustments in finishing facilities, if required, may be met in time to meet actual production needs. It is particularly important that steel requirements be defined in terms of mill products.

"In normal times many of the problems outlined above are the function of experienced management in the approximately 200 companies which comprise the steel industry. During the period of defense mobilization, and particularly for the duration of government controls, it is believed that these problems can be met only by enlisting the aid of skilled men from the industry. It is, therefore, recommended that the industry be requested to staff, with qualified men, those departments of the various government agencies having the responsibility for the production and distribution of steel and the establishment of ultimate goals.

"With such skilled assistance it should be possible to compile more accurate estimates of total steel requirements of present military programs properly phased to conform with the expected production schedules and including factual estimates for components, machinery and equipment, classed as 'B' products, which represent a substantial proportion of the total military needs. It should also be possible to make an accurate appraisal of steel requirements for full mobilization. While considerable effort has been given to the computation of military requirements, it has been impossible to uncover any source that could provide a really comprehensive estimate of total steel requirements, broken down into mill products, properly phased by quarters for the next 4 or 5 years. We respectfully point out that the lack of such information makes it impossible to give you anything more than conditional or approximate answers to your questions regarding the adequacy of steel."

". . . expanding production of taconite to conserve ores . . ."

". . . critical situation with respect to a particular steel grade . . ."



Other highlights of the report are summarized as follows:

As of Jan. 1, 1951, the rated capacity of the steel industry was 104,230,000 net tons of ingots. The announced capacity of 108,587,670 ingots for Jan. 1, 1952, represents an increase of 4.3 million tons, or 4 pct during the past year. Planned capacity as reported by steel producers has been scheduled to reach 118.1 million tons by Jan. 1, 1953, and 120.3 million tons by Jan. 1, 1954.

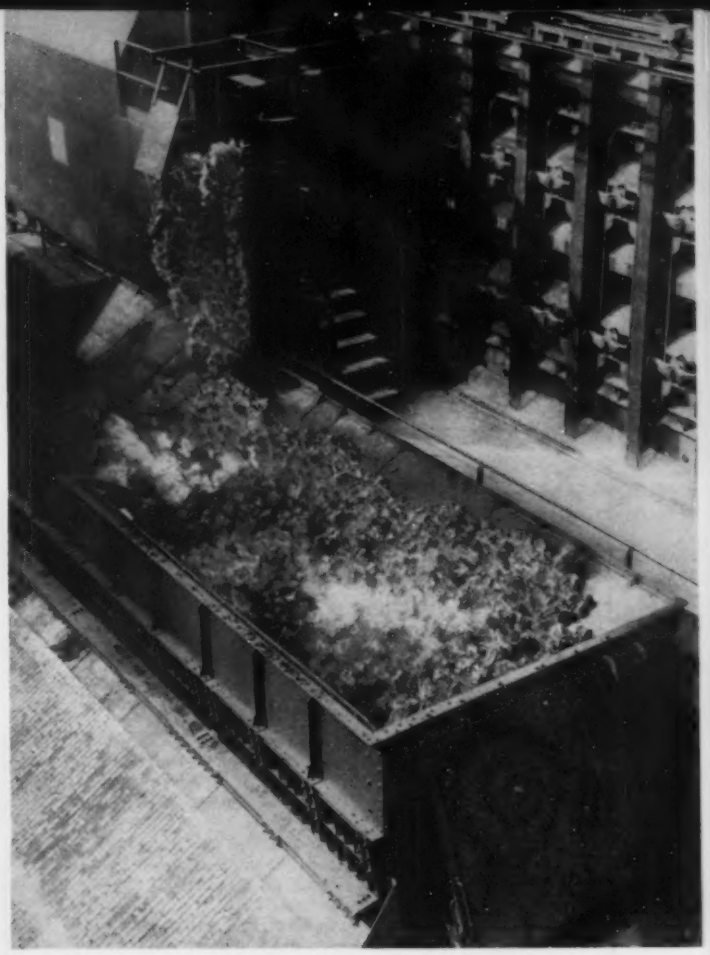
If these goals are attained as scheduled, the total ingot capacity of all producers (some 200 in number), at the end of 1953 will represent a total increase of 15.5 pct since Jan. 1, 1951, and an increase of 26 pct since World War II.

In support of the increased ingot capacity, pig iron capacity is scheduled to increase from 72,500,000 tons to 81,000,000 tons by Jan. 1, 1954. Concurrently, adequate finishing facilities will be provided to convert the ingots into finished mill products. After the completion of this survey, additional expansion plans were reported which, if carried out, would increase the industry's ingot capacity to 121.7 million tons and pig iron capacity to 83,800,000 tons by Jan. 1, 1954.

"The supply of alloys should receive . . . continuous vigilance . . ."

The expansion of the steel industry to its goal of 120.3 million tons by Jan. 1, 1954, can only be achieved if it is carried forward as now planned.

Any action taken to delay this program will postpone the production of additional steel for future requirements. It should also be realized that the interdependence of different phases of this expansion requires adherence to a coordinated schedule if new capacity shall be productive when completed. Consequently, no changes should be made in either the over-all program or the plans of the individual companies without consultation with experienced men in the industry. The progress of this program should also be studied constantly to assure a balanced relationship among its various segments and its complete conformance with actual needs.



"Overage coke ovens require scrutiny at all times . . ."

Meeting military needs

There is no question but that the *direct* military requirements for steel as now computed can be met satisfactorily. With regard to "B products" (components) future demands will constitute a significant addition to the total stated requirements of the military programs for steel. The total demand (including direct requirements and "B" products), however, can be satisfied if adequate provision is made for the requirements of the military "B" products. The adequacy of supply for military needs is based on present military plans and any change in these plans will naturally affect the relationship between military demand and supply.

While there is no fundamental basis for determining the adequacy of the future steel capacity for *full mobilization*, there is every indication that present goals will be adequate in the event of another world war.

Nevertheless a very critical situation may arise with respect to a particular grade of steel or an individual mill product. Although there is considerable flexibility in steel mill production, as was demonstrated in the production of plates on strip mills for shipbuilding during World War II, there are definite limita-

tions to this advantage. The failure to anticipate any substantial surge in the need for one or more of the usual mill products in time to provide the necessary facilities might result in a serious deficiency. It is particularly important therefore that the defense agencies make a long term estimate of steel requirements in case of full mobilization and that such requirements be stated as far as is possible by product and grade classification.

Those Who Did the Job

The members of the Steel Task Group, in addition to Mr. Batcheller, were:

Thomas Dimond, Youngstown Sheet & Tube Co.
Derrick L. Brewster, William Gilmour, Inland Steel Co.
R. W. Dalzell, R. W. Wolcott, Lukens Steel Co.
Harry Leopold, Jr., John A. Roebling's Sons Co.
John T. Anderson, Armco Steel Corp.
S. A. Fuller and **K. C. Allen**, Jones & Laughlin Steel Corp.
P. J. Sandmaier and **William P. Carlin**, Republic Steel Corp.
G. H. Love, Pittsburgh Consolidated Coal Co.
C. H. H. Weikel, Richard Thompson, Robert Woodward, Charles H. Herty, Jr., Bethlehem, Pa.
B. E. Etcheverry, Kaiser Steel Corp.
B. E. Estes, A. A. Monnett, J. L. Rich, E. S. Hughes, Werner Neumann, Anthony Siragusa, M. D. Corner, H. C. Stringfield, U. S. Steel Corp.
S. M. Norwood, Electrometallurgical Co.
H. F. French and **Joseph M. Weldon**, International Nickel Co.
Elton Hoyt, 2nd, Pickands Mather & Co.
C. W. King and **William A. Kirkpatrick**, Allegheny Ludlum Steel Co.
Ward A. Miller, Vanadium Corp. of America.
Carl M. Loeb, Jr., Climax Molybdenum Co.
J. T. Whiting, Alan Wood Steel Co.
Robert W. Zehring, Bureau of the Budget, served as Executive Secretary.

Based on the report's allowance for military "B" products, it is apparent that the increase in total steel requirements for defense, including components and machinery and equipment, has exceeded the expansion of the steel industry during 1951. It is expected that this condition will continue through 1952. However, if the total military demand follows the course as scheduled in December, 1951, and steel capacity expands as now planned, the potential supply of steel for non-military uses should reach its 1950 rate by the first or second quarter of 1953. Based on the same assumptions, it is also expected that the steel supply for other uses will then increase beyond the 1950 level to provide a higher rate of civilian consumption.

Availability of materials

During the entire course of this study it became increasingly apparent that the "danger area" in maintaining steel production at planned capacity lies in the available supply of materials. This obvious requisite creates numerous problems of which the following deserve primary considerations:

Scrap—An adequate supply of scrap is considered the principle requisite for increasing steel production. All possible sources must be developed. The supply is now critical and a scrap program is under way. Requirements for scrap will increase rapidly.

Pig Iron—Sufficient additional blast furnaces are being constructed to maintain the ratio between pig iron and steel capacity above 67 pct. While this projected ratio is somewhat below the actual ratio of recent years, it is based on the rated capacity of blast furnaces and does not take into full account the possibility of further increases in the productivity of blast furnaces and prospects for charging larger quantities of ore directly into openhearth furnaces. Blast furnaces are maintaining a higher rate of operations than previously (98 pct of capacity for the first 10 months of 1951 compared with 91.5 pct in 1950).

Iron Ore—It is believed that sufficient ore will be available to support the present and planned programs of 120 million ingot tons of steel for at least several years. Looking further to the future, continued operations of steelmaking capacity at this annual rate will greatly accelerate the depletion of our remaining high grade domestic ore supplies. This development will make the United States more dependent on foreign sources which will create a serious risk in case of a global war. The need for supplementing present domestic sources of high-grade ores with high-grade concentrates is paramount for developing national security. It has been concluded therefore that continual dependence on Lake Superior ore may be planned through 1956. At this time, a program for expanding the production of Taconite should be in operation so as to conserve the supply of high-grade ores and provide a reserve for an emergency.

Coke—The high degree of overage of by-product coke ovens and the dependence on beehive ovens require close scrutiny of this situation at all times.

Alloys and Coating Materials—In connection with overall steel production special attention should be given to manganese. This metal is a single-purpose material on which the steel industry is entirely dependent for maintaining total steel production. The great dependence of the United States on foreign sources intensifies its importance. In order to supplement present supplies and provide adequate protection in case of a global war further development of domestic sources seems imperative.

The essentiality of other alloys and coating materials has also been recognized and they were made the subject of a special study in June, 1951. However, new developments preclude a restatement of its conclusions. A continuing study is needed.

NEW ENGLAND: Metalworking Leads

Defense keeps industrial wheels humming . . . Economy shifting . . . Textiles slide while metalworking carries ball . . . Job openings offset losses . . . Financing helps—*By W. V. Packard.*

Rock-ribbed New England is today the land of an industrial paradox. The defense boom has furnished the impetus to keep the economy humming at a merry clip —for a while. But danger signs pointing to economic illness are still plainly evident. Midst the overall boom there is a bust—textiles.

The economy of this most industrialized region of the United States is shifting. Durable goods industries are booming; manufacturers of non-durables have a tough row to hoe — just as they do elsewhere in the country.

Leading the upsurge are metalworking plants. Expanding machine tool, electrical machinery, transportation equipment, electronics, primary metals and fabricating industries are carrying the ball for the economy.

Offset Losses—The New England Council recently reported that jobs in these industries had increased by more than 100,000 during the past year. This more than offiset job losses of 40,000 in textiles, 14,000 in shoes and leather, and 10,000 in jewelry.

Recent orders have temporarily brightened the outlook for textiles, leather and shoes. But no real cure for the ailments of the New England textile industry is in sight. During 30 years or more of treatment this patient has not responded. It is the downtrend in textiles that has caused some observers to jump to the conclusion that Yankee industry is withering on the vine. This is not so.

Textile firms are moving South for two reasons: Labor and taxes. In addition to North and South wage differentials, southern workers have in some cases taken on a 50 pct bigger work load. Textile firms estimate the total differential (including fringes) amounts to 40¢ an hr.

Union Hangs On—Workers at one New England textile mill, after a trial period, decided they could carry the heavier work load and accepted it. But this is the exception. The union and the mills have practically reached a stalemate. How to break it remains a tough problem, since the union won't give up northern gains, and hasn't the strength to hammer out similar contracts in the South. Many southern textile workers remain unorganized.

Taxes, both state and local, are aggravating the situation. There are seven states in the U. S. where tax-exempt bonds may be used to induce industrial expansion. Five of these states are in the South. There is little chance that New England states will decide to follow similar practice.

In Massachusetts a move is underway to establish a program (involving legislation) to keep old industries and entice new ones into the area. The plan would set up an independent Industrial Plant Trust to help firms construct modern plants on a lease-back basis. Authors of the plan went to great pains to overcome expected cries of socialism by specifying bonds would not be tax exempt.

"His family is fine, our cigars were delightful, a busy 1952 to us too, and the machines we want we'll get by July—1954!"

Since the state doesn't pay taxes to a municipality, provision is made for paying a fixed fee. This fixed fee, or tax, is aimed at eliminating charges of discrimination by other business men. It also furnishes protection against future increases, thus lowering cost of capital.

Other Credit Plans—The Maine Development Credit Corp. has been operating successfully for some time. But its activity is limited to 3 pct of the reserve of participating banks. This corporation helps firms that are unable to get risk capital elsewhere. Last year New Hampshire created a Business Development Credit Corp. along similar lines.

Of all New England industries, machine tools is the boomingest. A number of toolmakers have backlogs bigger than ever before in war or peace. Skilled workmen are at a premium, especially around Hartford, Conn., where competition from expanding aircraft production has brought official rating of scarce labor area.

In other areas labor is generally available, though it is turning tighter in most parts of Connecticut and some sections of Massachusetts.

Two bright new stars on the rise are electronics and chemicals.

Steel Mill — Yankee business men believe that the big shot of defense business they have received (it's above the national average) is just what the doctor ordered for their economy. It is giving them time to gird against the day when prince or pauper industries might lose their zip.

Despite the upsurge in metalworking, the drive for a regional steel mill has lost steam. About 3.5 million tons of new steel capacity is under construction in the East. Nearly 2 million more are planned.

COPPER: Raise Ingots From Lake

Over 300 tons will be raised from the bottom of Lake Huron . . . Went down on ill-fated schooner in last century . . . Found after years of searching . . . NPA, OPS help—*By W. W. Taylor.*

Over 300 tons of high-grade copper ingots would be welcome almost anywhere in industry these days. All of this and probably more will become available if ship salvage operations this spring are successful.

In 1870-71 the 3-masted schooner *Erma B. Reeves*, carrying a cargo of copper ingots, went down in 20 ft of water off Tawas Point, near Saginaw, Mich. Salvage attempts were unsuccessful, and the hulk now lies under 25 ft of sand. But marine salvage operator Julius F. Roth, assisted by Detroit National Production Authority officials, may get the metal to the mill 80 years later.

A dredging firm, the W. L. Emery Co., Detroit, will start salvage operations as soon as the ice breaks up in Lake Huron. This should be in April or early May.

Science Helps—University of Michigan scientists helped in pinpointing the cargo's exact location. A potentiometer was set up between two 150-ft cables, each connected to a wet battery. Batteries were dragged along the bottom until the potentiometer needle showed a large quantity of metal in the area. Outline of the cargo was marked with buoys.

Salvage will begin by dredging out the sand now covering the hull. Clam hoists will then haul the ingots to the surface. The salvage company estimates that sand pumping will take about 12 hours and raising the copper about 4 days.

Condition of the copper should be unchanged from its original state. And that, according to Mr. Roth, was very high grade, probably much purer than most refined today. Schooners of the *Erma B. Reeves* type usually carried cargoes of 400 to 500 tons. No definite conclusions have been reached as to the exact amount of copper aboard the old hull, but it may well run that high.

Fair Price—Office of Price Stabilization is now working out a fair price. Special consideration will be given to salvage costs. Final ceiling price may be close to 40¢ per lb.

To 75-year old Julius Roth, recovery of the metal will climax years of research and disappointment. The 6-ft, 9-in. salvage operator first received a reclamation permit from the Lake Survey Commission in 1947. The barge from which he was operating sank during a bad storm. He was served with a judgment for obstructing harbor traffic since he couldn't afford to raise the barge. Now, he is more confident of success.

Foreign Ore Late, Use Lake Ores

First test shipments of what may grow to substantial tonnages of Lake Superior District iron ores will soon go to the Tennessee Coal & Iron Div. of U. S. Steel Co., Birmingham, Ala. Reason for bringing in the Lake ores is that U. S. Steel's Cerro Bolivar ore development in Venezuela has not met its schedule, and the rich foreign ores are not yet available, the company explained.

"Another one of those guys with his office in his hat"

The Lake Superior ores are richer in iron content than local Birmingham ores with which they will be blended to increase production of TCI's blast furnaces. The first shipment of 60 carloads will be shipped by Oliver Iron Mining Div. of U. S. Steel and should reach Birmingham this week.

Divers Fish Scrap Out of Rivers

Two Alabama divers are recovering tons of needed scrap from river bottoms in that area. Lewis Spraggins, of Birmingham, and Tom Cadle, Hueytown, carry on the reclamation work as a sideline.

Realizing the present scrap shortage, the two men obtained permission to salvage two steamboats sunk in the Warrior River near Tuscaloosa 20 years ago. Now that the ships are stripped, the pair is raising eight boxcars that ran off a bridge into 30 ft of water.

Crude Sulfur Quotas Announced

Crude sulphur allocations for the first 6 months of this year have been held to 2,953,400 long tons by International Materials Conference.

Largest single allocation is 2,226,000 tons for the U.S., which also has the biggest export quota —465,000 tons.

Canada's allocation is included in the amount earmarked for the U.S. The United Kingdom will get 194,900 tons.

Estimated demand in the free world for 1952 is expected to exceed probable production by 1,539,000 tons.

Heating Ore to Offset Freeze

To prevent the freezing of ore in ore-transfer cars during dumping operations, Atlas Car & Mfg. Co. is installing a lacework of strip heaters in the hopper bottoms of their cars.

SEAWAY: Decision Must Come Soon

Canada ready to build it alone if necessary . . . U. S. defense officials cite need for power, Labrador iron . . . Largest U. S. part would be in International Rapids area—*By G. G. Carr.*

High on the agenda of both the Canadian Parliament and the U. S. Congress for the current sessions is the controversial St. Lawrence Seaway.

Alternately praised and damned for over 20 years, the project now seems close to realization. Canada has said it is ready to build it alone, if necessary. General feeling both there and in Washington is that the statement is no bluff. Naturally, the Canadian government would like some help with the job, and defense officials here think we can't afford not to give it.

The $818 million project has two parts: (1) deepening the St. Lawrence channel to let ocean-going ships into the Great Lakes, and (2) developing the river's hydroelectric potential. Dominion officials stress that country's need for more electric power; Washington wants an efficient water route for Quebec-Labrador iron ore for the Great Lakes steel mills. They point to the depletion of the Mesabi Range as a threat to national security. More power for New England and northern New York is another objective.

Three Jobs—Present plans call for major projects at three points (see map): the International Rapids section, the Soulanges section, and the Lachine section. Construction by the U. S. would be limited mainly to the International Rapids phase, which would also be the most expensive and complicated. A navigational canal, powerhouses, and dams must be constructed there. If Canada does the job alone, she will dig the channel on her side of the border and collect all the shipping tolls.

The Soulanges development lies wholly in Quebec, with the major portion of the work already completed. Further power development, locks and some dredging are all that remain to be done to complete the project in this area.

The Lachine project, immediately above Montreal harbor, requires navigational work only. But Canada is thinking of a major power development there too, and may combine the two phases. Other relatively minor parts of the seaway plan are shown on map.

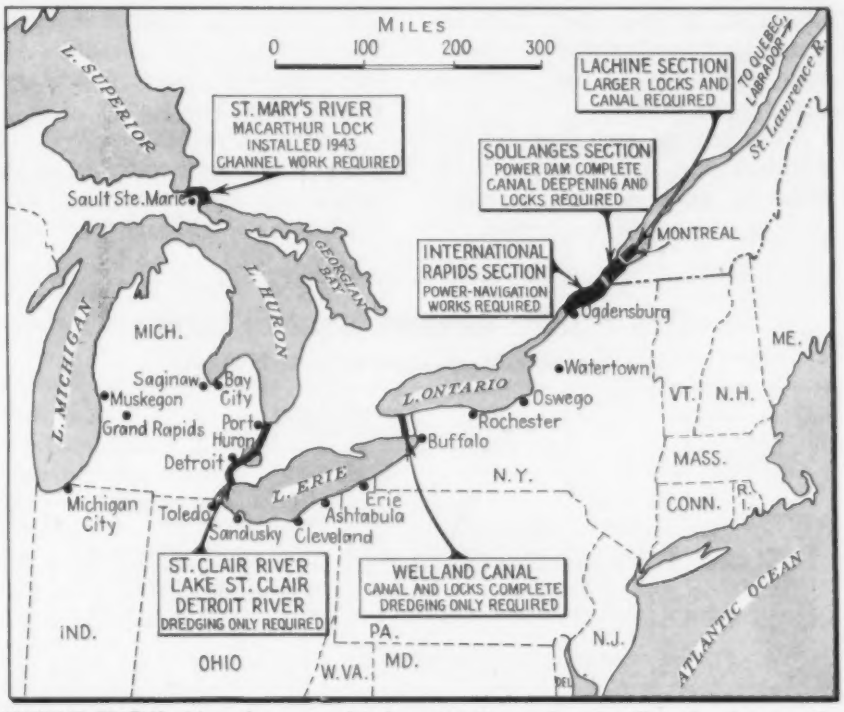
They're Agin It—Major U. S. opposition to the project comes from the railroads and steamship operators. The railroads fear substantial loss of revenues from hauling bulk cargoes of grain, ore, coal, etc. They claim that the proposed system of locks, dams, and canals would be even more vulnerable to attack than rail systems.

Steamship operators point out that plans call for a maximum channel depth of only 30 ft. Most U. S. ocean-going freighters should have about 35-ft channels for safety. Many foreign-flag ships, however, can use shallower passages. American owners claim the cost of transferring cargo from one size vessel to another would be exorbitant.

Other potent interests fighting the seaway include the coal and oil industries, United Mine Workers, and private utilities. All these groups want to avoid further competition from cheaper foreign oil and publicly-owned power.

East Coast—Atlantic and Gulf port cities, led by the Port of New York Authority, are also against the project. They fear the loss of a substantial volume of freight traffic.

A private fight that may affect support for the seaway is the quarrel between Federal Power Commission and New York State. Both groups want control of the whopping 12.6 billion kw-hr that the project would produce annually for consumption in this country. New York has already asked FPC for permission to participate if Canada goes ahead alone. Congressional approval would be necessary for federal participation.



PRESENT STATUS: Map shows completed construction and work still to be done on the much-discussed St. Lawrence Seaway. Canada pledges to build it alone.

FURNACES: Builders See Order Decline

Furnace makers meet in Pittsburgh . . . Backlog high but may dwindle as orders drop . . . Shortages of nickel, copper hamper output . . . Builders downgrade alloys—*By J. B. Delaney.*

The frost is off the pumpkin for industrial furnace manufacturers. They anticipate a shrinking order book during 1952. And although backlog of orders stood at a robust $103 million as of Nov. 30, 1951, if new order volume declines the backlog will dwindle.

Builders convened last week at the mid-winter meeting of the Industrial Furnace Manufacturers Assn. Consensus was that with an expected drop in orders builders could work off a sizeable chunk of their backlog—if they could get all the needed materials. Since materials are not likely to be that available, builders feel that momentum of the backlog will maintain shipments through 1953 at the current rate.

Most critical materials for the builders are nickel and copper. Steel is no bottleneck, partially due to the severer shortage of nickel and copper which becomes more influential in cutting back production.

Downgrade Alloys — Lack of nickel has forced the builders to downgrade their heat-resistant alloys. They realize that these heat-resistant parts will not stand up as long, but it's a matter of choosing the lesser of two evils. A furnace in production is helping the defense effort—one stalled on the assembly line helps no one.

There is no question that the furnace bottleneck is serious—as serious as any other. This is not due, though, to lack of capacity. The industry could produce and ship more but material shortages are causing delays.

During 11 months of 1951, industry sales were running at the annual rate of approximately $122 million. Sales through November totaled $102,865,679 — $56,386,916 in fuel-fired equipment, and $41,397,450 in electric resistance furnaces. This is close to record sales during 1942, a war year, of $128.7 million. Miscellaneous sales through November were $5,081,313. Shipments through November totaled $84,932,678.

Premature Delivery—The industry has some gripes. One is the failure of the military to balance its delivery requests on furnaces with the actual need of the defense contractor. Many times furnace builders have rushed delivery of equipment only to learn that the customer is not ready to use the furnace. In one instance a furnace was delivered at the military's request to a plant that had not been built yet. In self-defense, one builder has assigned a man to full-time investigation into the urgency of furnace requirements.

The industry has something of a skilled manpower problem. Obtaining good draftsmen is a headache. Compounding this headache, at least in the Pittsburgh area, has been the formation of so-called "drafting companies." These outfits lure away draftsmen with offers of higher pay, then offer drafting services to the builders at the rate of $5 an hour.

New Blood — Builders were urged by their manpower committee to consider setting up college scholarships in the field of metallurgy for promising high school graduates in an effort to compete with other industries for men.

IFMA is a 21-year-old organization with approximately 50 company members. These companies produce from 75 to 80 pct of the country's fuel-fired furnaces, 95 pct of the electric furnaces, and combustion equipment and low-temperature industrial ovens.

J. J. Walker, general manager of C. I. Hayes, Inc., Providence, R. I., was named president to succeed C. B. Kentnor, Jr., president of W. S. Rockwell Co., who resigned to serve with NPA.

IRON & STEEL: December Output By Districts

As Reported to the American Iron & Steel Institute

BLAST FURNACE —NET TONS DISTRICTS	Number of Companies	Annual Capacity	PIG IRON Dec.	PIG IRON Year to Date	SPIEGEL, FERRO-MANGANESE Dec.	SPIEGEL, FERRO-MANGANESE Year to Date	TOTAL Dec.	TOTAL Year to Date	Pct of Capacity Dec.	Pct of Capacity Year To Date
Eastern	12	13,870,680	1,127,110	13,649,938	27,593	326,734	1,154,703	13,976,672	98.2	100.8
Pitts.-Yngstn.	17	27,070,520	2,242,567	26,585,634	29,285	316,352	2,271,852	26,901,986	99.0	99.4
Cleve.-Detroit	6	7,110,600	584,827	6,919,843	.....	.....	584,827	6,919,843	97.0	97.3
Chicago	7	15,684,040	1,211,442	15,018,328	.....	5,694	1,211,442	15,024,022	91.1	95.8
Southern	9	5,310,740	463,045	5,198,319	7,895	96,601	470,940	5,294,920	104.6	99.7
Western	4	3,425,200	283,576	3,115,318*	.....	.....	283,576	3,115,318*	97.7	91.0
Total	38	72,471,780	5,912,567	70,487,380*	64,773	745,381	5,977,340	71,232,761*	97.3	98.3

STEEL —NET TONS DISTRICTS	Number of Companies	Annual Capacity	TOTAL STEEL (Incl. Alloy Steel, Carbon Ingots) Dec.	TOTAL STEEL Year to Date	Pct of Capacity Dec.	Pct of Capacity To Date	ALLOY STEEL Dec.	ALLOY STEEL Year to Date	CARBON INGOTS Dec.	CARBON INGOTS Year to Date
Eastern	25	20,823,230	1,743,651	20,680,996	98.8	99.3	147,577	1,680,509	359,943	4,370,013
Pitts.-Yngstn.	34	41,411,870	3,478,912	41,197,680	99.1	99.5	471,224	5,678,807	391,322	4,766,807
Cleve.-Detroit	8	9,601,940	825,495	9,759,327	101.4	101.6	64,433	820,282	86,136	1,181,395
Chicago	15	21,522,750	1,847,374	22,333,634	101.3	103.8	145,399	1,702,927	268,295	3,253,674
Southern	9	4,913,340	456,562	5,008,363	109.6	101.9	10,466	65,438	1,493	37,829
Western	11	5,956,520	533,135	6,154,553	105.6	103.3	6,469	129,931	42,735	405,643
Total	81	104,229,650	8,885,129	105,134,553	100.6	100.9	845,568	10,077,894	1,149,924	14,015,361

* Revised.

FONTANA: New Mill Beats the Odds

Greenhorns built mill in orange grove . . . Pessimists said it was waste of oranges . . . Kaiser Steel proves itself . . . Now entrenched in industry . . . Breaks records—*By R. T. Reinhardt.*

Ten years ago men who scarcely knew an ingot from a sheet built a steel plant in a West Coast orange grove. Many in the steel industry said their chances were dismal and that the enterprise was a big waste of oranges. The obstacles of inexperience and competition would constitute an unbudgeable anchor for the new plant.

Now, the pessimists are silent. In less than 10 years Kaiser Steel Corp. has installed itself firmly in the industry and has won respect of its competitors. The mill has posted production records—some of which are perhaps unrivalled.

As the president of one important competing steel company said on a recent plant visit: "Five years ago I wouldn't have given this set-up a fighting chance. I was wrong."

Here is the Fontana success story—what was done and how it was done.

Iron Production — Two blast furnaces designed to produce together 2400 net tons per day, cast an average of 2526 tons per day. Output was 921,752 tons in 1951, 40 pct over 1950. Average coke rate per ton of iron was 1400 lb as compared with a national rate of 1844 lb. Cost per ton of hot metal is understood to be approximately $21, as compared with costs in the Chicago area of approximately $27 per net ton.

During 1951, ore for the blast furnace burden came almost entirely from Kaiser's Eagle Mountain Mine in Riverside County, Calif. Ore shipments reached a total of 1,307,000 tons in 1951.

Eagle Mountain ore is carefully blended and about 40 pct sintered before charging. Most of the coking coal comes from the company's Sunnyside mines in Utah where it is washed and graded. This high volatile coal is blended with approximately 11 pct of low volatile coal from the Oklahoma-Arkansas district. Ideal strength of coke for use in these blast furnaces has been found to be 26 to 28 tumbler.

Blast furnace down-time has been consistently lowered. Last year it averaged 10 hr and 13 min per month per furnace (1.4 pct of total time). Better grades of limestone have improved fluxing to increase production.

Steel Production—Ingot production in 1951 was a record 1,317,643 net tons, 15 pct above 1950 and 500 pct over the first year's production in 1943 of 259,617 net tons. Now in operation are eight openhearths from which the average size heat during 1951 was 225 tons. Tap-to-tap time ran 10 hr and 21 min for an average production rate of 21.8 tons of steel per furnace hr for the year.

In 1951 ingot production exceeded by more than 217,000 tons the entire output of the seven western states in pre-war 1941. This high production was accomplished with the low average fuel rate of 2.84 million BTU's per ingot ton.

High production of hot metal was accompanied by the use of large quantities of iron ore in the openhearths which averaged 153 lb (iron basis) per ton of ingot during the past year.

Finishing Mills—A new record for rolled and tubular products was set in 1951 when 947,784 tons were shipped to top 1950 by 147,200 tons.

Much of the credit for increases in finishing mill production goes to the rebuilding of Kaiser's 36-in. Mesta blooming mill through which all ingots for finished products must pass.

REBUILT: Kaiser Steel Corp.'s Fontana Works greatly increased its finishing capacity by rebuilding this Mesta 36-in. blooming mill.

When steel was first made at the plant in 1943 ship plate was the only product and was rolled direct on a 110-in. reversing mill from bottom-poured ingots.

Soon the Mesta single-stand, 2-high, reversing mill was used as a breakdown mill for the structural mill. As the range of finished products increased, this mill was rebuilt to increase the lift by raising the pinion stands 9 in. to its presently designed lift of 73 in. and now produces blooms, slabs, and billets for all other mills.

Surpasses Self — Although the mill was originally designed for a much lower rate of operation, last year it averaged 96,642 tons with a record of 107,560 tons in October.

The veteran 110-in. plate mill continues to turn out plates as well as furnish the sheet stock for the 4-stand, 86-in. sheet mill.

In addition to flat-rolled products, Fontana now produces bars, structurals, continuous weld merchant pipe and electric weld pipe. Within a few months a cold reduction strip mill, a Ferrostan electrolytic tinning mill, and hot dip tinning pots will be in operation.

GAS: New Illinois Storage Field

Herscher dome reservoir part of industry's search for underground storage areas . . . Planned for 1953 . . . Will be one of four aquifer sites in U. S. . . . Home use upped—*By K. Bennett.*

To make supplies of natural gas more available, American industry will spend $500 million over the next 3 years. (THE IRON AGE, Nov. 1, 1951), p. 76.) A firm step forward in the campaign is the Herscher reservoir projected for northern Illinois in 1953.

A 90 billion-cu-ft natural gas reservoir located 50 miles south of Chicago's Loop will begin supplying that city and 200 outlying communities during the 1953-54 heating season. Approximately 65,000 potential customers are on waiting lists in the Chicago area, with thousands more requesting service in a region involving six states.

Into Storage—One of four "aquifer" type storage sites in the U. S., the Herscher dome will be developed and operated by the Natural Gas Storage Co. of Illinois, affiliate of Peoples Gas Light & Coke Co., Chicago. Feeding the reservoir will be 17 miles of pipeline from the Texas-Illinois system pipeline to the West.

Natural gas will be pumped from the Herscher reservoir through 44 miles of 30-in. pipeline to the long distance Texas-Illinois pipeline terminals at Joliet.

Prime problem in natural gas usage is the "25 pct" utilization by home owners, who place a peak load on the gas terminals during the 3 cold months of the year. They make very little use of heating fuel during the remaining 9 months. The 90 billion-cu-ft reserve storage space should allow full use of long distance pipelines at all times of the year and provide better service for interruptible, commercial users of natural gas.

At a development cost of between $40 and $45 million, the Herscher dome will deliver a peak-day maximum of 1.5 billion cu ft to at least 26 utility companies now served by the Natural Gas Pipeline Co. of America, and Texas-Illinois Gas Pipeline Co., both affiliates of Peoples Gas Light & Coke Co.

No Leaks—Principle behind aquifer storage is the displacement of underground salt water by natural gas, pumped down into a natural dome or anticline. The gas is trapped in porous sandstone beneath gas-tight layers of rock. Herscher dome lies 1750 ft below ground surface, underlies 15,000 acres, and will be topped by as many as 35 to 50 wells when in full operation. At least 25 wells will be constructed during the first year of operation.

The gas will be pumped down at a pressure of 1000 lb psi, driving out salt water that has a pressure of 701 lb psi, which will be driven down and out from the dome to form a lateral gas seal. Beneath the dome lies a strata of black shale. Over it are layers of limestone, dolomite, and shale that prevent upward leakage.

Has Land—Natural Gas Storage Co. of Illinois has to date purchased 80 pct of the Herscher area, which sprawls across northern Iroquois county and western Kankakee county. With the granting of approval by the Illinois Commerce Commission and the Federal Power Commission, further acquisitions may be obtained under the eminent domain law enacted last year by the Illinois General Assembly.

Occupying 60 acres of surface over the dome will be (1) a compressor station, (2) a power generating station, and (3) a dehydration plant to remove moisture as the natural gas is withdrawn from storage. This unit will make available to consumers on peak days about 2½ times the delivery now available through three pipelines, will do the work of three long distance pipelines costing $135 million each.

"Just think of me as one of the boys."

New Crude Oil Pipeline Completed

Gulf Refining Company has completed a 152-mile steamheated crude oil pipeline from Mississippi oil fields to the state docks at Mobile, Ala. The first tanker was loaded from the pipeline recently, with the tanker *Gulfglow* taking on a cargo of 105,000 bbl for an East Coast refinery.

The first unit of the pipeline is a 10-in. line running 64 miles from the Eucutta field to Lumberton, Miss. From Lumberton the oil runs into a second unit, a 14-in. line, that carries it another 88 miles into Mobile.

Heater stations have been set up at 10-mile intervals to keep the oil at a high temperature so it will flow readily.

Expect Fuel Shortage in East

Government officials expect a fuel shortage to develop in the East if the balance of the winter is normal or colder than normal. Expected deficit would be about 10 pct or 6 million bbl of distillate fuel for February and March.

Bruck K. Brown, deputy chief of Petroleum Administration for Defense, testified before the House Interstate Commerce Committee that enough oil is available on the Gulf Coast but that high tanker rates would make it uneconomical for industry to move it to the East Coast. Under study is a plan to subsidize transport of the oil.

INSTRUMENTS: Busy Year in Prospect

Expansion of basic industries will spur instrument makers to good volume . . . Deliveries slow . . . Shortages trouble field . . . Lack of part sometimes delays production—*By R. L. Hatschek.*

Instrument makers expect 1952 to be fully as good a year for their business as 1951. They point to expansions in most basic industries—expansions which require all sorts of measurement and control devices — and modernization of older plants to keep up with latest developments in manufacturing methods.

Delivery of instruments is generally slow. They are some of the most complex of tools and spot shortages of single items can hold shipment of almost complete equipment. One type of relay, for instance, cannot be delivered for 48 weeks—and neither can the instruments requiring it.

Most troublesome material shortage is nickel, though copper alloys and aluminum are also tough to procure. Great quantities of nickel are not required but the metal is vital for certain necessary characteristics.

Facilities Taxed—Other difficulties instrument makers must cope with under current high-demand conditions are inadequate facilities and a shortage of skilled or trainable workers. One plant visited by THE IRON AGE was using halls, passageways, even the men's room for storage of the items it does have on hand, mainly operating supplies such as chart paper and thermocouple wire. But the industry has expanded since World War II and is still expanding.

Competition within the instrument industry is primarily of a technological nature with each company seeking better ways to do more things, do them with greater accuracy and with higher speed. One example of this is the Leeds & Northrup Co. "Microcarb" which directly measures the carbon content of a furnace atmosphere—a trick never before accomplished—and then automatically controls the amount of carbon going in. The end result of such competition is a more versatile range of measuring and control devices made available to industry as a whole.

Trends Noted — One apparent fact is that newer industries make fuller use of automatic devices while older, more conservative industries are more apt to stick to the older methods of manufacture. This, however, is being overcome and the trend toward heavier instrumentation can be seen in such staid old industries as baking, textile and ceramic as well as the more modern ones.

Demand seems to be swinging over to vacuum tube or electronic types and away from mechanical methods of instrumentation. The reason is that they can give a proportional control which anticipates conditions—and do it faster than other types. These controls can not only shift valves but also vary the rate of that shift. This results in much more even control and a temperature chart, for instance, will show an almost straight line instead of a sinusoidal type of wave.

From Start to Finish in 6 Months

When B. F. Goodrich Co. was looking for subcontractors for B-47 wheels and brakes, it thought of revitalizing the Pryor Manufacturing Co. Not in active operation at the time, all the company owned was empty buildings. But Pryor officials had a sound background of magnesium processing, gained in World War II, and a lot of enthusiasm. Six months and 7 days after the order was placed, the first wheel and brake was finished.

In picture below, industry and Air Force officials inspect the first B-47 wheel and brake produced by Pryor. Looking on are, from left to right: Jim Pedler, B. F. Goodrich Co., the prime contractor; Lt. Col. Burley and Col. Schmitt, Air Materiel Command; and M. H. Pryor, president of the sub-contracting company.

ALUMINUM: Air Force to Return Excess

Surplus second quarter allotment to be returned to DPA . . . Air Force has overestimated needs, perhaps by 10,000 tons . . . Strengthens belief that other agencies guessed wrong.

Officials last week reluctantly confirmed a report that the Air Force would shortly return to the Defense Production Administration a "substantial" tonnage of second quarter aluminum allotments which could not be used during that period.

Amount of the excess allocation was not revealed at the time. But officials who are supposed to know have privately estimated that it would range up to perhaps 10,000 tons.

Suspected—This was the first confirmation of a contention widely held both by industry and the National Production Authority that defense agencies were overestimating requirements for scarce metals in relation to industrial ability to turn them into planes, tanks and guns.

There was some speculation that this action by the Air Force which, in effect, amounts to a cutback, would likely continue to a lesser degree into the third and last quarters. New fabrication facilities will come into production gradually over the period.

But this news does not necessarily brighten the sky for manufacturers of automobiles and other consumer goods. Chances are that they will get but little, if any, of aluminum so released.

Three Uses—DPA Administrator Fowler said any excess allotments turned back would probably be distributed for one or all of the following three major purposes:

(1) For taking up slack from previous carry-overs. There was strong belief that officials would recommend this. An earlier report by DPA showed that this carry-over is already about 95,000 tons. NPA is trying desperately to reduce this carry-over so as to make good its CMP tickets.

(2) Split up the excess among the claimant agencies, most of which received substantially less than they needed for the second quarter. The share for consumer hard goods would be relatively small compared to needs.

(3) Take advantage of the unused aluminum to repay borrowings from the stockpile. This is not seen as likely.

Reports have been rampant that Congressional pressure would bring a substantial supplemental allocation for boosting the automobile output to 900,000 vehicles.

Feb. Copper Quotas Announced

February allocations of copper raw materials have been released by National Production Authority.

In making the allocations to materials producers such as brass mills, wire mills and foundries, NPA has taken historical patterns established by users prior to June, 1950, and balanced them against current needs of defense.

PAPERWORK: A major part of the last week's Cleveland sales meeting of U. S. Steel Corp.'s American Steel & Wire Div. was a panel discussion on material and price controls. H. M. Francis, vice-president, sales (left) and John Graham, general manager, sales, each hold an armful of the regulations discussed.

Tonnage allocations by products are:

Refined Copper

Brass Mill Products	46,583
Wire Mill Products	50,872
Foundry Products and Others	5,785
Exporters	3,560
Total	106,800

Copper and Copper-Base Alloy Scrap

Brass Mill Products	36,000
Alloy Ingots	27,500
Foundry Products and Others	13,600
Total	77,100

Industry Controls This Week

NPA Orders:

Brass and wire mills were notified over the weekend that they were to place controlled materials orders on their books up to 122 pct of their current directives for accepting and scheduling orders.

CMP Reg. 1, Dir. 7; CMP Reg. 3, Dirs. 1, 2, & 3; and CMP Reg. 6, Dirs. 3 & 4—Revoked.

M-5, Revised—Makes order conform to CMP. Guarantees all holders of CMP aluminum tickets positions on a mill schedule. Dirs. 1, 2, & 3 revoked.

M-11, Revised—Changes definitions of certain brass and copper mill products. Revokes Dirs. 2, 3, & 4. Issues Dir. 5, which provides self-certification for distributors of copper foundry and copper powder mill products to replace in inventory goods sold to fill ACM orders.

M-25, Revised—Tin can specs.

M-47—Revoked.

M-88, Amend.—Adds aluminum conductor wire and cable products.

OPS Orders:

GOR 9, Amend. 13—Exempts from control rutile ores, concentrates.

GCPR, SR 70, Rev. 1—Raises ceiling prices of domestic lead and zinc ores and concentrates 2¢ per lb.

CPR 1, Rev. 1, SR 1, Amend. 1—Provides alternate price increase adjustment factor.

CPR 22, SR 7, Amend. 4—Allows manufacturers of cobalt chemicals to pass on the price increase in cobalt.

CPR 30, Amend. 30—Transfers ceiling prices on machinery installations to CPR 93.

CPR 30, Amend. 31—Includes diamond powder and bort in commodity classification for industrial diamonds.

Truman Accepts Capehart Plan

President Truman has accepted the "terrible Capehart amendment" in the proposed new Defense Production Act, soon to go to Capitol Hill. Proposed legislation will replace the earlier act which expires June 30.

The Administration's acceptance was described as a "rear-guard action" to prevent extension of Capehart's cutoff dates into this year. Controls officials still don't like the amendment but fear worse if the steel industry starts asking for higher prices to offset possible wage rises.

Revised M-5 Conforms to CMP

All holders of Controlled Materials Plan allotments for aluminum will, upon application to National Production Authority aluminum and magnesium division, be guaranteed positions on a mill schedule under a general revision of M-5 to make it conform to CMP.

Other changes include: provision that production must be carried out only on authorized production schedules or directives; restrictions of sales of imported aluminum to Authorized Controlled Materials orders; and the 15th of the first month of the preceding quarter is set as the deadline for filing an application for an authorized production schedule.

In addition, NPA will require mills and fabricators to accept 100 pct of their authorized production schedules for each quarter plus any carry-over of orders from the previous quarter.

New Triplate NPA Form Issued

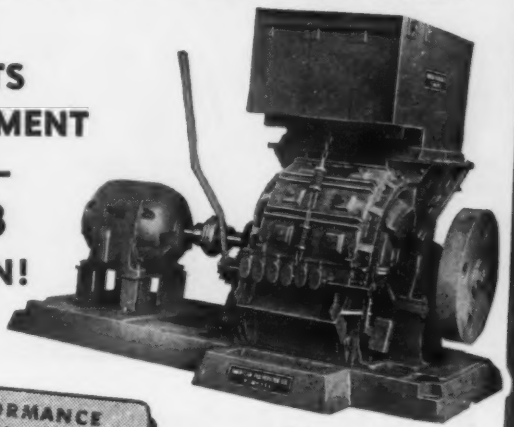
Effective at once, National Production Authority says that all applications for priorities, materials or any other type of assistance should be made out in triplicate.

Applicants are likewise requested to use a recently-approved form (NPA-132, "Application for Adjustment or Exception") rather than submit a letter. Instructions on filing the triplicate applications are spelled out in the revised M-69 (Sulfur) and the new M-94 (Sulfuric Acid) orders.

More "CRUSHING" FACTS ON American CRUSHER PERFORMANCE

American METAL TURNINGS Crusher AVERAGES 1000 TONS MONTHLY

. . . PARTS REPLACEMENT COST— $0.03 PER TON!



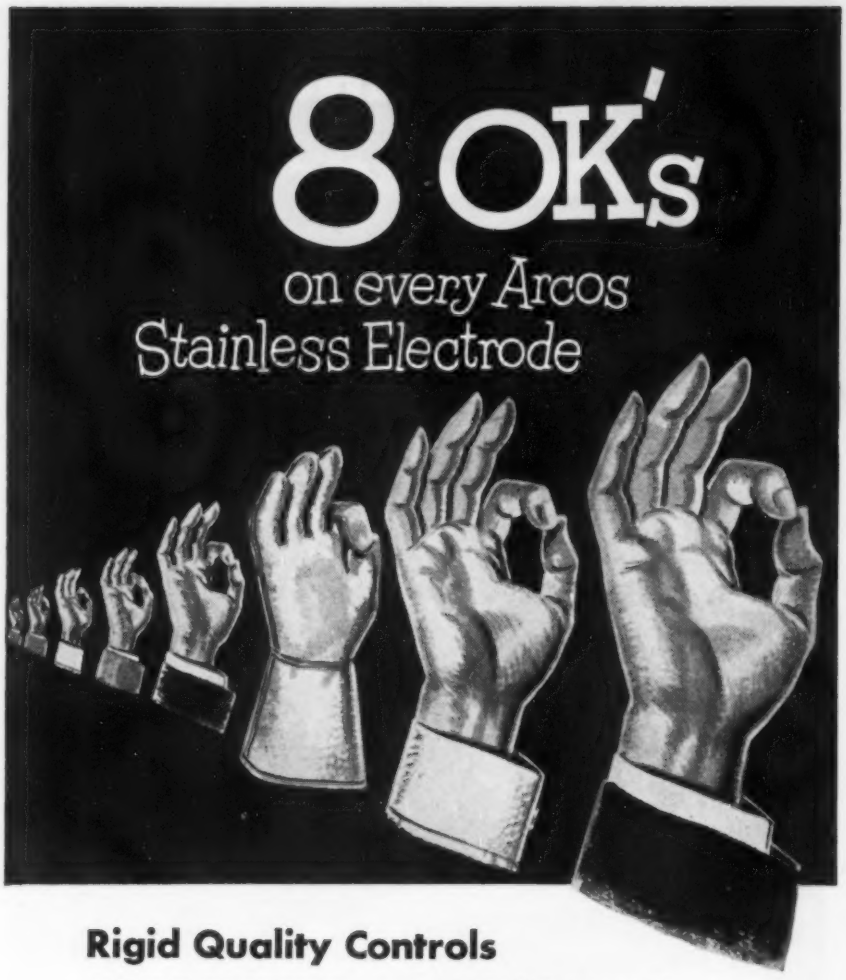
PERFORMANCE DATA — Case History No. 14

PROBLEM: To reduce machine turnings to shoveling chips.
INSTALLATION: American Metal Turnings Crusher #3800.
AGE: 6 years in operation.
TONNAGE: Average 1000 Tons Per Month
TOTAL PARTS TO DATE: $2,028.30.
PARTS COST PER TON: $0.03

This performance record of a well-known Detroit manufacturer is familiar to other American Crusher owners, who have long since learned that there are 3 significant profit sources in every American installation: (1) American-reduced chips bring $4 more per ton in the scrap market, (2) Chips release up to 50 gallons per ton in recovered cutting oil, (3) Chips require less storage space . . . are easier to handle.

WRITE for Metal Turnings Crusher Bulletin

American PULVERIZER COMPANY
Originators and Manufacturers of Ring Crushers and Pulverizers
1439 MACKLIND AVENUE • ST. LOUIS 10, MISSOURI



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GUARANTEE Better Weld Metal

• There's no room for guesswork in manufacturing Stainless Electrodes that will produce consistently high quality welds on every application. That's why the raw materials that go into Arcos Stainless Electrodes must meet rigid specifications . . . why every electrode must pass so many quality tests before it's put to use. It means complete assurance that the weld metal will be physically, chemically and metallurgically right for the job you want to do.

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Specialists in Stainless, Low Hydrogen and Non-Ferrous Electrodes

Renegotiation Reports in Mail

Forms to be used by all manufacturers subject to renegotiation by the Government are being mailed this week by U. S. Renegotiation Board to some 17,000 contractors and subcontractors. All income from negotiated military contracts since Jan. 1, 1951, must be reported on the two new forms (RB 1 and RB 1B).

Firms receiving less than $250,000 from their government contracts (or brokers, agents, manufacturers' representatives, and sales engineers receiving less than $25,000) need complete only five questions on Form RB 1. These contractors are not required to state the amount of receipts or costs or to submit other detailed financial information. Additional information is required in Form 1B, which is to be submitted only by those whose income rose above the $250,000 minimum for contractors or $25,000 for agents.

Chrome Stainless Off CMP

National Production Authority on Monday removed straight chrome stainless steel from coverage under the Controlled Materials Plan and began a study of a similar action on insect wire screening.

Directive 9 to CMP Reg. 1, while retaining sufficient control to see that defense needs are met, provides that it is no longer necessary to apply for CMP-4B allotments for purchasing non-nickel-bearing stainless steel.

This action, said Administrator Fowler, is in line with NPA's "established policy of relaxing or revoking orders or regulations which might threaten to become habitual."

First Action—This is the first major decontrol action in the metalworking field although limitations on use of bismuth were lifted in mid-January. Seven decontrol orders have been issued altogether including methyl chloride and plastic type nylon.

A proposal that tool steel also be removed from controls was discarded last week after study. Officials say that they want first to be sure that controls would not

have to be reimposed again at some later date.

An alternative suggestion by industry that separate allotments be issued for tool steel has also been put aside on the grounds that such procedure would make CMP even more cumbersome than it is.

Plan New Reinforcing Bar Price

Ceiling prices for fabricated concrete reinforcing bars will be computed on the basis of dollars-and-cents markups over current mill costs, as a result of a tailored regulation being worked on by government pricers.

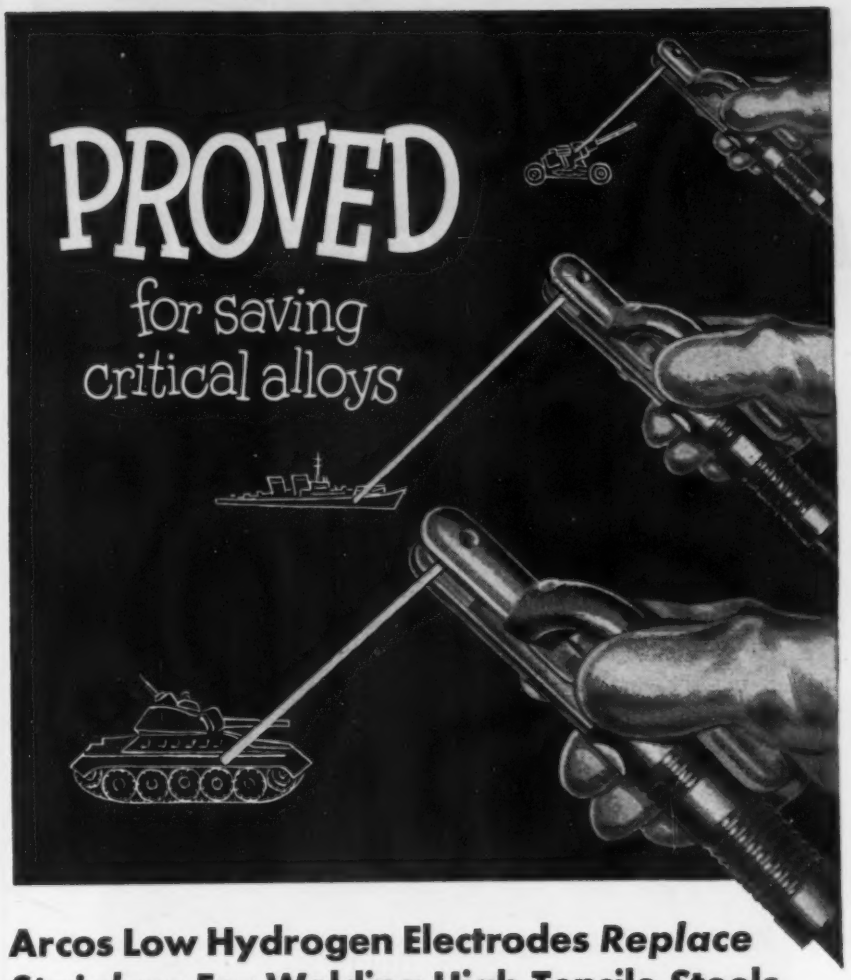
A tentative draft of the order, reviewed in detail by industry representatives, provided that size, quantity, bending, and engineering extras also will be factors in price determination. Final order will allow for traditional pricing practices and methods used by producers.

Spokesmen for the industry have recommended clarifying language and additional changes for inclusion in the regulation.

CPR 98 Clarification Planned

Metals specialists at Office of Price Stabilization are working on an amendment, for possible issue shortly after Feb. 1, intended to clarify ambiguities and correct errors in Ceiling Price Reg. 98, covering resale of iron and steel products.

FLAME THROWER: Boxcars with mounted flame throwers are used to thaw out switches and crossings at Republic Steel's Canton and Massillon, Ohio, steel plants. Using diesel oil for fuel the flame throwers open a switch in less than 5 min as opposed to a 30-min hand operation.



Arcos Low Hydrogen Electrodes *Replace Stainless* For Welding High Tensile Steels

• Each day sees a growth in the requirements of nickel and chromium for defense production. The increased use of low hydrogen electrodes on welding high tensile steels is helping to free more of these critical alloys.

ARCOS low hydrogen electrodes are far removed from the experimental stage—they've already been "time tested and approved" on armor welding, as well as commercial applications. With them you get trouble-free, uniform welding performance because every one must pass the same rigid quality controls set up for Stainless.

ARCOS CORPORATION

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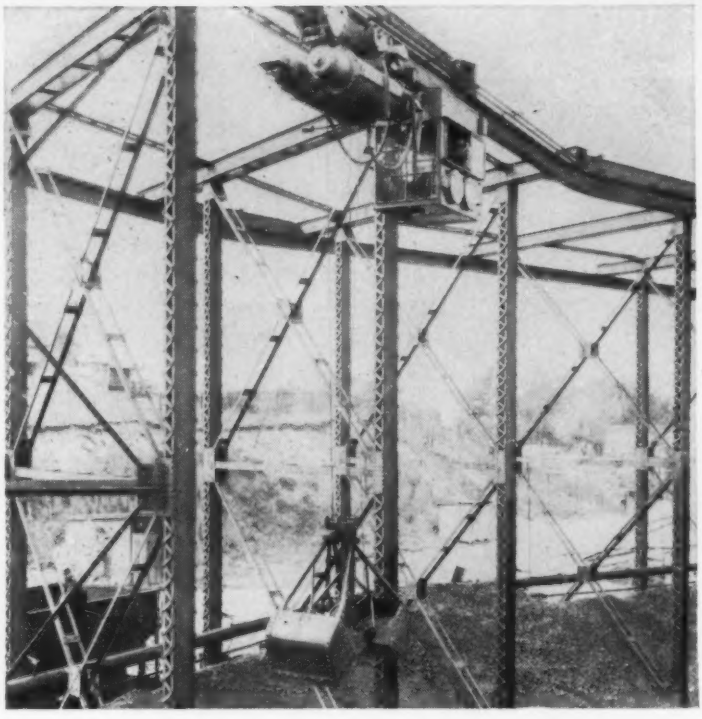
WELD WITH ARCOS

Specialists in Stainless, Low Hydrogen and Non-Ferrous Electrodes



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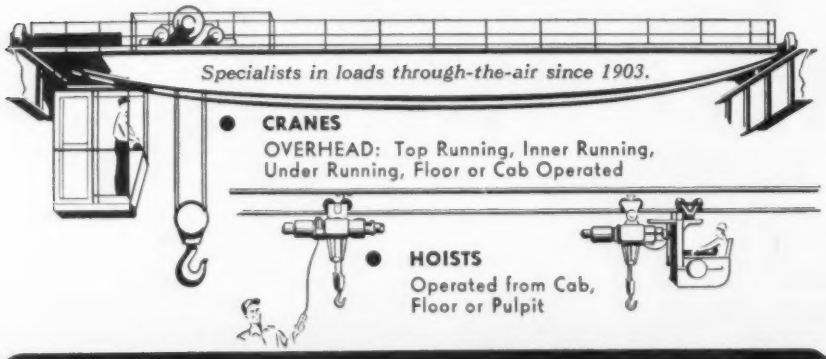
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Steel Inquiries and Awards

Fabricated Steel Awards this week include the following:

840 **Tons,** Clay and Richmond Counties, Ill., bridge ST7-2F to Allied Structural Steel, through Diamond Engineering Co., General Contractor.

350 **Tons,** Kane County, Ill., bridge Sec. RV-F to Wendnagel Co.

335 **Tons,** Auburn, Neb., bridge ER-F-21/1 to Pittsburgh Des Moines Steel Co.

220 **Tons,** Chicago, Factory building for Magnaflux Corp., to Wendnagel Co.

Fabricated Steel Inquiries this week include the following:

397 **Tons,** Hudson County, N. J., overpass on State Route 3, Sec. 1D, New Jersey State Highway Dept., bids due Feb. 14.

110 **Tons,** Newcastle County, Del., bridge, Contract No. 977, Delaware State Highway Commission, bids due Feb. 20.

Reinforcing Bar Awards this week include the following:

500 **Tons,** Philadelphia, Mercy - Douglas Hospital, Mark & Co., same city, low bidder.

200 **Tons,** Bloomsburg, Pa., elementary school, Ralph Woelfel, Hazelton, Pa., general contractor, to Bethlehem Steel Co., Bethlehem.

170 **Tons,** Wilmington, Del., Drew School, Turner Construction Co., Philadelphia, low bidder.

125 **Tons,** Philadelphia, Pennsylvania Railroad freight facilities, John McShane, Inc., same city, general contractor, to Truscon Steel Co.

Reinforcing Bar Inquiries this week include the following:

8700 **Tons,** Ft. Randall, S. D., Spillway Lake Andes Reservoir, bids due Feb. 15.

340 **Tons,** Prospect, Ill., Dial office, Illinois Bell Telephone Co.

182 **Tons,** Cranberry & Jackson townships, Butler county, Pa., divided highway including reinforced concrete bridge, Pennsylvania Dept. of Highways, Harrisburg, Pa. Bids to Feb. 21, 1952.

1951 Construction Award Totals

Total 1951 construction contract awards for the 37 states east of the Rockies were $15,751,131,000 or 8 pct over 1950, according to F. W. Dodge Corp.

Non-residential awards reached $6,822,513,000, 31 pct more than the year before. Residential contracts of $6,205,388,000 were 8 pct under 1950. Public and private works and utilities totaled $2,723,230,000 in 1951, 6 pct more than the previous year.

Fabricated Structurals at Peak

More fabricated structural steel has been shipped in 1951 than in any of the past 20 years, according to American Institute of Steel Construction. And 1952 looks like another peak year. Shipments this year totaled 2.7 million tons.

Detroit Unemployment Meetings

A special trouble-shooting committee, dispatched by Defense Production Administrator Fleischmann, was scheduled to meet this week, Jan. 29-31, in Detroit with labor, management, and public officials to see what can be done about unemployment in that area.

R. E. Gillmor, representing DPA, is acting as chairman of the group which includes Special NPA Assistant Administrator Malcolm S. Macomb and Courtney Johnson, director of NPA's Motor Vehicle Div.

Meetings have been set up with Gov. G. Mennen Williams, regional mobilization officials, and leaders of both the automobile industry management and labor committees.

Results of the meetings will be reported back to the full Distressed Areas Task Force which was recently set up by Fleischmann and is comprised of representatives of nine government agencies.

SSB Approves Welfare Benefits

Salary Stabilization Board has ruled that health and welfare plans covering salaried and wage employees alike may be put into effect without SSB approval if they meet with the requirements of the Wage Stabilization Board.

Plans affected by the ruling include those concerning temporary disability compensation, hospital expenses, in-hospital expenses, surgical expenses, and group life insurance or accidental death and dismemberment benefits.

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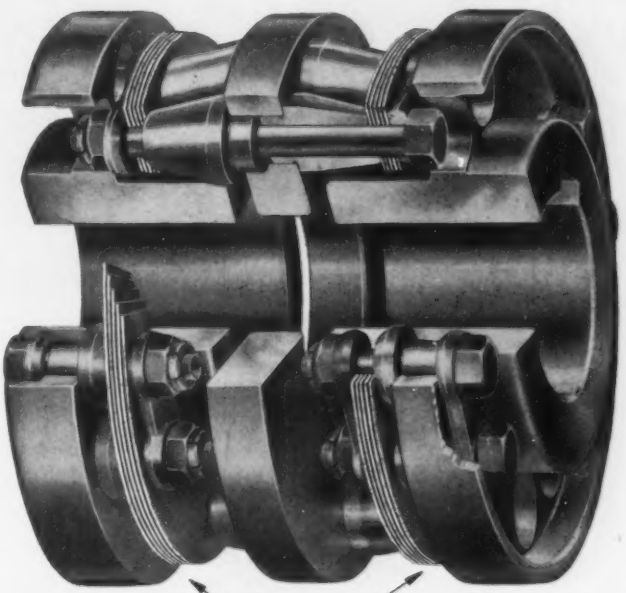

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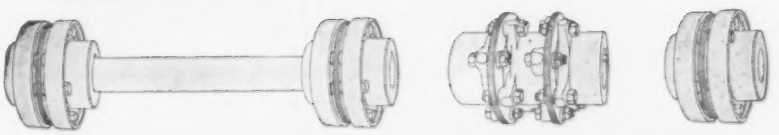

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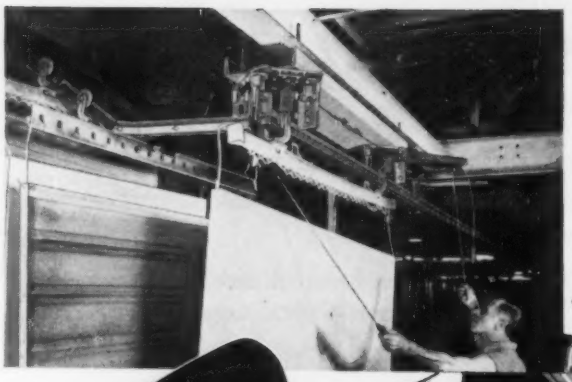
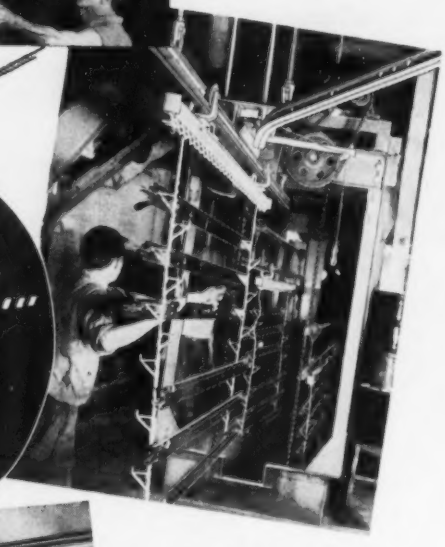


Carriers roll off power conveyor in finishing oven to crosstrack switches for 90° transfer to shipping area.

MORE *Production...* SAME *Space*



Carriers descend through degreasing tank on power-operated chain conveyor

Solenoid operated switch automatically brings trolleys on parallel tracks into single track alignment.

A well-known metal partition manufacturer faced the problem of increasing production without enlarging building. New and better handling methods were obviously needed. They chose an American MonoRail overhead handling system as the best answer to increase capacity without increasing space and **with less handling labor.** Now, this American MonoRail system handles the steel components from receipt of raw materials, through finishing to shipping. The system boosted production, cut handling labor, improved space utilization, reduced material damage, bettered working conditions, and improved production control.

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Government Inviting Bids

Latest proposed Federal procurements, listed by item, quantity, invitation, No. or proposal, and opening date. (Invitations for Bid numbers are followed by "B," requests for proposals or quotations by "Q").

Naval Supply Depot, Mechanicsburg, Pa.
Screws, mach set, 276700 ea, 72-25199 B, Feb. 18.
Gauges, pressure and compound, 6554 ea, 72-20625 B, Feb. 18.

Ordnance Tank Automotive Center, Detroit.
Sleeve, crane winch, 80, 52-1135 B, Feb. 19.
Worm and shaft, frt winch, 290, 52-1135 B, Feb. 19.
Shaft, rear winch propeller assy, 500, 52-1135 B, Feb. 19.
Sleeve, outer boom pivot, 660, 52-1135 B, Feb. 19.
Shaft, frt winch rear propeller assy, 460, 52-1135 B, Feb. 19.
Sprocket, boom, 600, 52-1135 B, Feb. 19.
Shoe, jack, 170, 52-1135 B, Feb. 19.
Spring, boom, 52-1135 B, Feb. 19.
Lever, frt winch clutch shifter yoke, 430, 52-1135 B, Feb. 19.
Link, shift rod, 460, 52-1135 B, Feb. 19.
Rocker, rear winch brake band assy, 240, 52-1135 B, Feb. 19.
Case, rear winch gear assy, 100, 52-1135 B, Feb. 19.
Valve, globe iron, 4000, 52-1005 B, Feb. 14.
Valve, check ball Vertical, 300, 52-1005 B, Feb. 14.
Bolt, car rd hd, 1,025,000, 52-1083 B, Feb. 4.
Bolt, mach rd hd, 30000, 52-1083 B, Feb. 4.
Bolt, hex hd, 52,000, 52-1083 B, Feb. 4.
Pivot, boom assy, 80, 52-1135 B, Feb. 19.
Lever, hand trans. shifter, 230, 52-1160 B, Feb. 25.
Pin, boom jack, swivel assy, 1200, 52-1160 B, Feb. 25.
Fork, assy, 440, 52-1160 B, Feb. 25.
Stop, boom pivot, 200, 52-1160 B, Feb. 25.
Clutch, frt winch propeller shaft drive shaft assy, 170, 52-1160 B, Feb. 25.
Shaft, winch drum, 130, 52-1160 B, Feb. 25.
Bearing, hand swinger eccentric, 179, 52-1068 B, Feb. 29.
Plug, single pto case cover hole, 1000, 52-1068 B, Feb. 29.
Shaft, hoist, 549, 52-1068 B, Feb. 29.
Shaft w/sleeve assy, 300, 52-1068 B, Feb. 29.
Shaft, winch vertical roller, 100, 52-1068 B, Feb. 29.
Arm, power take-off, 100, 52-1068 B, Feb. 29.
Power, take off assy, 600, 52-1068 B, Feb. 29.
Power, take off assy, 300, 52-1068 B, Feb. 29.
Declutch, boom swinger assy, 70, 52-1068 B, Feb. 29.
Chain, gear box to crane winch, 350, 52-1160 B, Feb. 25.
Journal, propeller shaft universal joint, 680, 52-1160 B, Feb. 25.
Frame, rear winch end assy, 70, 52-1160 B, Feb. 25.

Quartermaster Purchasing Division, Ohio.
Water pump kit, 2500 ea, 52-259 B, Feb. 11.

Navy Purchasing Office, Washington.
Wrenches, structural, 5488, 2821 Q, Feb. 5.
Trucks, crane, gasoline, 362, 3075, Feb. 12.
Conveyors, electric, portable, 210, 3171 Q, Feb. 21.

Supply Dept., Procurement Sect., Washington.
Pallet, rack steel, 4100 ea, 733 B, Feb. 4.

Ordnance Tank Automotive Center, Detroit.
Link, cowl ventilating assy, 684, 52-1146 B, Feb. 15.
Rail, cab, top deck lt. side assy, 3845, 52-1180 B, Feb. 15.
Governor, power tire pump assy, 300, 52-1180 B, Feb. 15.
Puller, valve seat insert, 1280, 52-1021 B, Feb. 15.
Box, master term assy, 300, 52-298 B, Feb. 15.
Box, master switch assy, 200, 52-298 B, Feb. 15.

Contracts Reported Last Week

Including description, quantity, dollar value, contractor and address:

Milling machines, 195, exceeds $250,000, Cincinnati Milling & Grinding Machines, Inc., Cincinnati.

Vertical milling machines, 4, $167,948, Cincinnati Milling & Grinding Machines, Inc., Cincinnati.

Plain cutter and tool grinder, 40, $167,530, Cincinnati Milling & Grinding Machines, Inc., Cincinnati.

Hydraulic pumps, 20, $72,533, Vickers, Inc., Detroit.

Turret lathes, 60, exceeds $250,000, Gisholt Machine Co., Madison, Wis.

Cylinder and ram assy, 16, $122,087, McKiernan-Terry Corp., Harrison, N. J.

Gear final drive, 800 NO., $125,840, Western Gear Works, Belmont, Cal.

Automotive repair parts, 19 it, $11,073, Colyear Motors Sales Co., Los Angeles.

Spare parts, 76 it, $12,726, Charles W. Carter Co., Los Angeles.

Repair parts, 214 it, $13,570, Ford Div. Ford Motor Co., Dearborn.

Spare parts, 70 it, $14,216, Al Monroe Service Inc., Los Angeles.

Repair parts, 27 it, $14,410, M. D. Parts Mfg. Co., Los Angeles.

Gears and sockets, 18 it, $14,528, Edward R. Bacon Co., San Francisco.

Truck repair parts, 134 it, $15,287, Diamond T. Truck Co., Los Angeles.

Repair parts, 68 it, $17,281, The Heil Co., Milwaukee.

Automotive repair parts, 172 it, $38,796, Willys-Overland Motors Inc., Toledo.

Ice maker, electric, 111 ea, $199,245, York Corp., Los Angeles.

Repair parts diesel engines, 125 it, $24,744, Cummins Engine Co., Columbus, Ohio.

Automotive repair parts, 36 it, $27,132, Highland Park Auto & Truck Supply, Los Angeles.

Repair parts, 263 it, $27,622, Continental Motors Corp., Muskegon, Mich.

Automotive repair parts, 23 it, $31,265, Highland Park Auto & Truck Supply, Los Angeles.

Drill, electric, portable, 3290, $86,545, Cummins Co., Chicago.

Drill, electric, portable, 1605 ea, $75,044, The U. S. Electrical Tool Co., Cincinnati.

Mechanism, elevating and traversing, 4500 ea, $136,065, Steel Parts Mfg. Co., Hazel Park, Mich.

Key, knob elevating, 5300 ea, Steel Parts Mfg. Co., Hazel Park, Mich.

Key, elevating screw, 1600 ea, Steel Parts Mfg. Co., Hazel Park, Mich.

Washer, elevating screw sleeve, 2200 ea, Steel Parts Mfg. Co., Hazel Park, Mich.

Washer, 16000 ea, Steel Parts Mfg. Co., Hazel Park, Mich.

Booster, exceeds $250,000, Dickerson, Inc., Monroe, N. C.

Shell, smoke, exceeds $250,000, Basca Mfg. Co., Indianapolis.

Wrench, vent, 100 ea, $72,303, R. H. Bouligny, Inc., Charlotte, N. C.

MPTS for fuze, exceeds $250,000, Silex Co., Hartford.

Replenishment of hardware, 134000 ea, $70,930, Firestone Tire & Rubber Co., Akron, Ohio.

Replenishment of motor vehicle parts, 587 ea, $40,209, Oakland Truck Sales, Inc., River Rouge, Mich.

Replenishment of tools, 20 ea, $99,500, Richle Testing Machines Div., East Moline, Ill.

Replenishment of tank & combat vehicle parts, 71000 ea, $35,000, Grinnell Screw Products Co., Detroit.

Motor generator sets, 25, $36,076, Electric Boat Co., Bayonne, N. J.

Repair parts for diesel engines, 2424, $78,894, Norberg Mfg. Co., Milwaukee.

Repair parts for reduction gears, 707, $49,004, Farrel-Birmingham Co., Inc., Ansonia, Conn.

Repair parts for steering engines, 1721, $36,952, J. D. Christian Engrs., San Francisco.

Turn Page

Automobile door lock assembly, one of the many items made by Hancock with the help of Clearing presses.

VALUE at a FAST PACE

In Jackson, Michigan, the Hancock Mfg. Co., producers of automobile hardware, like the way this bank of Clearing presses stick to their jobs. Long experience with high-volume, high-tempo, production runs has made Hancock a pretty good judge of press stamina.

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—Defense Contracts—

Continued

Filter assys and repair parts, 3381, $33,803, The Cuno Engineering Corp., Meriden, Conn.

Repair parts for diesel engines, 18505, $164,141, Cummins Engine Co., Inc., Columbus, Ind.

Expansion joints, 375, $34,413, Goodall Rubber Co., Trenton, N. J.

Repair parts for reduction gears, 301, $32,480, Michigan Tool Co., Detroit.

Repair parts for electric equip, 31393, $35,815, Cutler-Hammer Inc., Milwaukee.

Hydraulic motor, 1 itm, $39,500, The Rucker Co., Oakland, Calif.

Shipyards Share Navy Contract

One shipyard in the Great Lakes region, two on the West Coast, and three in the East will build 148 picket boats for the Navy under terms of contracts totalling $4,918,000.

Hacker Boat Co., Mt. Clemens, Mich., will act as lead yard in distributing plans for the 45-ft vessels. The Navy said there will be no central procurement of material.

Firms receiving awards, and the number of boats each will build, are:

Hacker Boat Co., 25.

Fellows and Stewart, Inc., Wilmington, Calif., 35.

Blanchard Boat Co., Seattle, Wash., 25.

Hubert S. Johnson, Boat Manufacturer Co., Inc., Bay Head, N. J., 11.

Wheeler Boat Co., Freeport, N. Y., 25.

Vaughan Shipyards, Inc., Wickford, R. I., 27.

DuPont Readies for Powder Output

DuPont expects to have approximately 3000 workers on powder production lines at Indiana Ordnance Works, Charleston, Ind., by July, to manufacture propellant powders for artillery and small arms ammunition under terms of a new contract with Army Ordnance.

The company, signed to operate the works on a cost-plus-fixed-fee basis, intends to recruit most of its labor force in Indiana and Kentucky. The government will defray actual costs of operation and pay duPont a fixed fee for each pound of powder produced and for its management services.

Build Defense for British Steel Swap

Mobilization men say ingots are in reasonably free supply . . . Stump against daylight savings time as power saver . . . Push weapons research . . . Stockpiles grow fat—*By G. H. Baker.*

Sales patter from mobilization officials assigned the task of justifying the loss of 1 million tons of steel to England is now shaping up this way:

Ingots will comprise the bulk of the shipments, and ingots are in "reasonably free supply."

Critics of the barter deal (aluminum and tin for steel) are calling attention to the fact that there is substantial unused steelmaking capacity in the German Ruhr.

Blame Copper—Defense Production Administration says shipment of the ingots to Britain "should not have any effect" on future steel allotments to civilian producers in the U. S. during second half of 1952. They claim that if civilian output is cut again, it probably will be the result of the copper shortage.

American consumers of civilian goods actually can't afford not to "go along" with the barter deal, so the DPA argument runs, because the 20,000 tons of tin the British have agreed to ship from Malaya will go a "long way" toward relieving shortage of housewares and related lines in U. S. homes.

"Propaganda Hooey" — Farm-bloc in Congress is ganging up on proposals to save electric power this year through nation-wide daylight savings time.

Rep. O'Hara (R., Minn.) says the idea is "one of the biggest bunches of propaganda hooey ever put out."

Senate-House watchdog committee on defense production is backing national daylight savings as a means of reducing the peak demands for power, particularly in the Northeast. Committee says flatly that the supply of electric power will not be sufficient to meet both defense and civilian needs during the next 3 years.

Committee also urges speed-up in research leading toward construction of generators powered by atomic energy, and additional construction of steam plants to supplement hydroelectric plants.

Pushes Arms Research—President Truman has asked Congress to appropriate $1.4 billion for research and development by the Defense Dept. in fiscal 1953. This sum, if approved, will be $400 million more than the amount allotted for the current fiscal year.

New types of weapons and equipment, far superior to those of World War II, are now in the hands of U. S. troops, Mr. Truman reveals in his budget message.

"More new and improved weapons are now going into production, and we are perfecting the development of still others," he says.

"But we didn't even earn that much!"

Fat Stockpiles—Value of strategic materials in U. S. stockpiles should hit the $5 billion mark by June 30, 1953, the White House believes. In addition, federal buying agencies will have under contract at that time an additional $1.7 billion worth of scarce materials for delivery after that date.

This reserve of rubber, copper, tin, manganese, chromite, tungsten, cordage fibers, and more than 60 other materials will be an important source of strength for years to come, President Truman says. He is asking for $155 million in new obligational authority for fiscal 1953 stockpiling—about $435 million less than was appropriated for the current fiscal year.

Total expenditures for stockpiling in fiscal 1953 are estimated at $1.1 billion as compared with $800 million in 1952.

Power Shortage—Consumers of electric power generated by government plants are headed for critical periods, Tennessee Valley Authority warns.

TVA is telling Congress that it is no longer able to match growing demands for power with increased output. Expanding military production and atomic energy operations are blamed for the sharp rises in power consumption.

Household consumers definitely face periods of curtailed power deliveries, according to TVA engineers. Situation will not improve to any marked degree until 1954, when new generating capacity is switched into use.

Minimum Wage—National minimum wage would be increased to $1.25 per hr, under provisions of a bill (H. R. 6160) now under consideration in Congress.

Rep. Isidore Dollinger (New York Democrat) is backing the bill, which has been referred to the House Labor Committee. Congressional leaders see little hope of early favorable action.

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120 DIETZ ROAD

TOOLS: Government Extends Aid

Congress committee sees 1952 as billion-dollar year for machine tool makers . . . Gives credit to ingenuity of producers and priorities aid . . . Raps Defense Dept. planners.

Government aid and guidance for the machine tool industry is now slated to extend into late 1953 or early 1954.

This broad promise of assistance, with aggressive emphasis on procurement of materials and manpower, should boost the value of machine tool deliveries this year to well over the billion-dollar mark, according to the Senate-House watchdog committee on defense production.

Fact that the industry is today running at capacity or better—after an agonizing, 18-month build-up period—is due entirely to the ingenuity of its producers and priorities assistance from Washington, the committee found last week in a 107-page report on the industry's state. (See p. 87 for possible cutbacks on lathe orders.)

No Credit—Deliveries in 1951 will reach about $629 million—double the 1950 figure—and are expected to total about $1.3 billion in 1952, the committee predicts. But government planning officials, particularly those assigned to the Defense Dept., are due little or no credit for this impressive record of gain in output.

"In spite of the military's claim that it was not possible to estimate future requirements, government officials, including the Defense Dept., should have shown a far greater appreciation of the growing urgency for whatever action was necessary to substantially increase production of machine tools and cut down the heavy backlog," the committee states in its report.

Summary of the industry's present position as seen by the committee: The machine tool shortage is by no means over, but the major bottlenecks are now virtually broken. Industry now has the necessary aids to expand its production month by month until output is pacing demand.

Recommendations—Government agencies are told by the committee to look into these four industry recommendations for speeding production:

1. Modify the 4 pct interest rate now charged on the 30 pct advance payments extended under the pool-order contracts. Either eliminate the charge or modify the price regulation to permit this interest as an element of cost.
2. Extend the same profit margin to uncompleted tools in event of termination as applies to completed tools under the pool-order contracts.
3. Establish a renegotiation policy for the industry.
4. Find ways to prevent defense plants from pirating skilled operators.

Fast Action for Trust Gripes

Reports of alleged antitrust-law violations are to receive speedier handling under a new government prosecution policy.

Attorney General Howard McGrath is instructing all Justice Dept. field offices to report more promptly any suspected violations of federal antitrust statutes.

Under the new handling arrangement, district attorneys are to obtain all necessary details and transmit the material, with recommendations, to the antitrust div.

Easier Renegotiation Expected

Transfer of military contract renegotiation agencies to the independent U. S. Renegotiation Board will simplify procedures for many defense contractors.

This prediction was made by Renegotiation Board Chairman John T. Koehler after his agency assumed control over the Military Renegotiation Policy and Review Board and the Armed Services Renegotiation Board.

Use of the independent agency, created by the Renegotiation Act of 1951, as a central authority will not nullify provisions of the military renegotiation regulations in the 1948 act. These will continue in force, subject to amendment by the Renegotiation Board, but references to delegates of the Defense Secretary will be considered references to the board.

Opposes Steel Price Rise

Economic Stabilizer Roger L. Putnam says both he and Price Stabilizer Mike DiSalle are convinced that the steel industry can absorb a "considerable" increase in wages without raising prices. He says the industry has "considerable absorption capacity." In testimony in Washington before the Senate-House Economic Committee, Putnam said he did not want to prejudge the pending wage negotiations, but added that "the steel industry can absorb some wage increases without a price increase."

Wage Stabilization Board panel is studying USW-CIO demands for a wage hike of 18½¢ per hr, plus other benefits.

Form New Metals Advisory Board

Dr. Francis C. Frary, recently-retired Aluminum Co. of America research director, heads the new U. S. Minerals and Metals Advisory Board, formed to counsel the Defense Dept. and other government agencies on mineral technology and metallurgy.

Vice-chairmen of the board are Dr. Zay Jeffries, retired vice-president of General Electric Co., and Dr. Robert F. Mehl, director of Metals Research Laboratory, Carnegie Tech.

The panel is a reconstitution of the Metallurgical Advisory Board set up in January, 1951. Among the board's interests are broad advisory services on metals.

Industrial Briefs

Consolidated—The export operations of GARLOCK PACKING CO. have been consolidated and the New York office has been made headquarters of this division. The new offices are at 30 Church St.

Plant Expansion—The DELTA-STAR ELECTRIC CO., a division of H. K. Porter Co., has started a $500,000 plant expansion program. Scheduled completion date is August, 1952.

Acid Plant—GULF OIL CO. has let contracts for a new sulfuric acid plant and a polymerization plant to be built at its Port Arthur, Tex., refinery. The acid plant will increase capacity at Port Arthur by 300 tons per day. The polymerization plant will make a high octane gasoline from propylene, which is currently being burned at the refinery as fuel gas.

Congratulations—Officials and sales personnel from all over the U. S. and some foreign countries observed the 90th anniversary of the LUCKENHEIMER COMPANY at the 1952 Sales Conference in Cincinnati. The company, founded in 1862, has developed into one of the world's foremost manufacturers of valves and engineering devices.

Expansion Program—E. D. Wolcott, president of the B & T METALS CO., Columbus, Ohio, has announced plans for a $2,175,000 expansion program to provide for increased production of Chromedge Metal Trims. The plans, which embrace new plant facilities, are scheduled for action this year and next.

New Branch—A new branch warehouse, located at 4832 S. Kedzie Ave., Chicago, has recently been completed by the COLUMBIA TOOL STEEL CO. The new warehouse will stock the principal tool steels which the company produces.

Merger — The PENNSYLVANIA SALT MANUFACTURING CO., Philadelphia, has consolidated all sales and service in chemical specialties for metal cleaning, fabricating and processing in the Metal Processing Dept., which will be headed by J. J. Duffy, Jr., sales manager.

Icebreaker — The INGALLS SHIPBUILDING CORP., Birmingham, has been awarded a contract to build a new type icebreaker for the U. S. Navy. The icebreaker, which will be 310 ft long with a beam of 74 ft, will displace 8300 tons, and will carry enough fuel and provisions to circle the earth three times without stopping. It will be built at the company's Pascagoula, Miss., shipyards.

New High Level—An increase in 1951 of nearly 9 pct in blast furnace production of pig iron and ferroalloys is reported by the AMERICAN IRON AND STEEL INSTITUTE.

Belgians to Attend—Several Belgian machine tool builders will exhibit at the ASTE INDUSTRIAL EXPOSITION in Chicago, Mar. 17-21. Besides machinery exhibits, three representatives of major Belgian builders will attend personally.

New Cable—A new type of coaxial cable, employing aluminum as the outer conductor and sheath, is being marketed by PHELPS DODGE COPPER PRODUCTS CORP. In addition to being considerably more efficient, the cable will be cheaper than that previously available, the firm says.

"Him and his lucky horseshoe!"

Move Planned—CLIPPARD INSTRUMENT LABORATORY, INC., Cincinnati, will move to a modern new plant at 7350-7390 Colerain Ave. between Mt. Airy and Grossbeck, Ohio. The move is planned in order to keep pace with greatly increased demand for test instruments, r f coils, windings, sub-assemblies and other electronic equipment.

Office Opened — SPRAGUE ELECTRIC CO. has established a Pacific Coast application engineering office and radio noise suppression laboratory to better serve the growing electronics and aircraft industries of southern California. The new office is located at 11325 Washington Blvd., Culver City, Calif.

Company Formed—A new company, known as PRECISION FLEXO-PRESS CORP., has been formed to engineer, manufacture and sell high speed automatic stamping presses. The new company will be located at 910 Baymiller St., Cincinnati.

Equipment Supplied—Approximately $565,000 worth of electrical equipment will be supplied by Westinghouse Electric Corp., for a 25-in. structural mill for the COLORADO FUEL AND IRON CORP., Pueblo, Colo. The drive will replace an old ac constant speed drive and will provide maximum flexibility of operation.

Change of Address—The Communications and Electronics Div. of MOTOROLA INC., is now producing from new quarters at 4501 W. August Blvd., Chicago. The new building has been renovated to consolidate all activities of the division.

New Dealer—To represent several machine tool manufacturers in the Chicago and Milwaukee areas, Walter J. Murphy, Robert R. Heidemann, David Asmus, John B. Laing, and James D. Baillet, have organized the FOUR STATES MACHINERY CO., 5304 West Chicago Ave., Chicago. Among the manufacturers represented: Cincinnati Shaper Co.; Federal Press Co.; Glove Tool & Engineering Co.; Kane & Roach, Inc.; Kaufman Mfg. Co.; Reed-Prentice Corp.; and Webb Corp.

BOTH MANAGEMENT AND LABOR are seeking the best method of solving the retirement problem. A real measure of financial security is the goal, but there is no standard method for achieving this goal. The great variation in earnings and working conditions in companies and trades create the need for different approaches to the common problem.

Our Pension Trust Division has acquired a unique experience in developing all types of pension systems for a great number of trades and businesses. This experience can be invaluable in working out a pension plan to fit the income and employee benefit requirements of your company. We shall be glad to discuss with you any pension problem you may have, including pension costs. No obligation whatever.

WE ACT AS TRUSTEE UNDER PENSION AND PROFIT-SHARING PLANS AND AS AGENT FOR INDIVIDUAL TRUSTEES.

Write or call the
PENSION TRUST DIVISION,
The National City Bank of New York
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Ask for our Pension Booklet IA4.

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Olds Lands on Its Feet with War Work

Exception to rule that war work lag bites deep into employment . . . Worker loss held within 10 pct . . . Moves fast on contracts . . . What steel is easy, what's tight—*By W. G. Patton.*

Oldsmobile is an outstanding exception to the rule that defense work in the Detroit area is lagging drastically. Under the direction of J. F. Wolfram, general manager, Olds moved very fast on its initial bazooka rocket contract. Production got under way just 6 months after a letter of intent was received. Rocket output reached the contract peak last December.

Similarly, Olds moved quickly with its production of 90-mm tank cannon. Gun output is expected to reach the peak schedule called for under the defense contract in February.

See Increase—Employment has held within 10 pct at Oldsmobile. There have been no layoffs; but quits have not been rehired. If present defense contracts are not cut back, Olds employment may jump 25 to 35 pct before the end of the year.

Oldsmobile is not loudly claiming honors, but it may have the best record in the auto industry for taking up the slack caused by cutbacks in the production of civilian automobiles.

Nonferrous Hike? — Detroit is sure Washington will soon announce a boost in allowable copper and aluminum. While nothing official has yet come out, consensus is that Washington action will soon be announced.

The Easy and Tight—Reports that steel is easy in Detroit are misleading. Some kinds of steel are easy. To be specific, certain wire products, cold-finished bars, and some hot-rolled sheet grades are quite readily available.

Meanwhile, hot-rolled carbon bars and carbon and alloy forging billets are very tight. Wide cold-rolled sheets are still not too plentiful.

Copper and aluminum have won the headlines. However, a number of grades of steel are still relatively difficult to obtain—in the grade and quantity required.

Lost Forever—Since the turn of the year, the automobile industry has lost much car production that will never be regained. The industry will have to produce over 90,000 cars per week from Feb. 1 through Mar. 31 to reach the first quarter production goal of a million cars. Average output so far has been about 50,000 cars per week—below par.

Nipped in Bud—A current gripe of the automobile industry is that, for many months, engineers have been at work finding ways and means to substitute aluminum for copper. Just when their conservation programs were beginning to go places, Washington restricted aluminum on the same basis as copper.

"Yep—completely automatic."

"We have wasted much time and money and are frustrated in our substitution program," Ernest R. Breech, executive vice-president of Ford, complained last week.

Boron Steels — The industry's metallurgists are in complete agreement on this fact: Boron additions increase the hardenability of steel. However, even with respect to its hardenability and tensile properties, some plants are reporting different results from the same heat of steel.

Much work remains to be done before boron steels attain industrywide acceptance. Fatigue properties have not been thoroughly investigated. There is little data on machinability which, however, seems to be satisfactory. Other characteristics of boron steels requiring investigation include weldability, resistance to temper brittleness, and distortion.

Despite limited experience with carburized boron steels, these compositions undoubtedly offer the best hope today for conserving nickel, molybdenum, chromium and manganese.

Here to Stay—The march of the hardtop auto body seems irresistible. Buick, for example, has reportedly lifted its percentage of hardtops from 12 to 21 pct. The Pontiac hardtop share of its market has jumped from 9 to 12 pct.

Meanwhile, another body style seems to be gaining popularity. The changeover from wood to steel has had a great deal to do with improving the market for station-wagons. It could easily be the motor makers have been overlooking a bet for years by insisting on the wagon-like look for station-wagons. Ford is expected to make a strong appeal with its new station-wagon designs in 1952.

NEW MODELS: Change Inside and Out

List outstanding features of 1952 models . . . Mercury restyled . . . Cadillac gets more power . . . Willys puts out all new sedan . . . Buick has 16 body styles . . . Hudson goes "hardtop."

During the past several weeks motor car manfacturers have been releasing details on their 1952 models. So many introductions have come within a comparatively brief period that detailed descriptions of all the new models are possible. Here, in summary form, are the outstanding features of several 1952 models. Details of other models have previously appeared here.

Mercury — Completely restyled for 1952. Doors hinged in the front. A double bumper bar combines the functions of grille and bumper. More visibility and larger luggage compartment with new T-release lock. Brake and clutch pedals suspended from a bracket. One-piece curved windshield. Extra frame bracing. Engine horsepower increased from 112 to 125 hp. Compression ratio up to 7.2 to 1 from 6.8 to 1.

Cadillac—Horsepower increased to 190 by adding a four-barrel carburetor, new manifold and twin exhausts. The new carburetor permits better breathing of the engine and almost doubles air intake capacity. Only two barrels are used in ordinary driving.

Power-assisted steering is optional on the 1952 Cadillac. Cadillac engineers emphasize their new power steering is superimposed on the present steering system so the driver retains the "feel" of driving the car. A second "performance range" has been added to Hydra-Matic.

Brake drums have ribbed-backs to give improved heat conductivity. Front wheel drums have been increased to 12 in. Other features include improved shock absorbers, full rubber body mountings, a new grille.

Willys — An entirely new car, Willys claims 90 new features. Styling is along "hardtop" lines, with wrap-around rear window and two-piece, curved windshield. Wheelbase is 108 in. and overall length 180⅞ in. Height is 60 in. Powerplant is the "Hurricane 6," with an F-head. Compression ratio is 7.6 to 1 to give 0.56 hp per cu in. displacement.

Willys engineers claim up to 35 miles per gal with overdrive at 30 mph. The car offers 61-in. seating width, front and rear. Body and frame are integrated and built as a single unit.

Buick—Features 16 body styles and four horsepower ratings on four wheelbases. Roadmaster powerplant is rated at 170 hp. Engineering changes include larger front wheel brakes, improved body and engine mountings, better insulation. Styling improvements include new rear fender ornaments, restyled bumper-grille combination and new sweepspear moldings.

Top engineering improvements include four-barrel carburetors, power steering on all models.

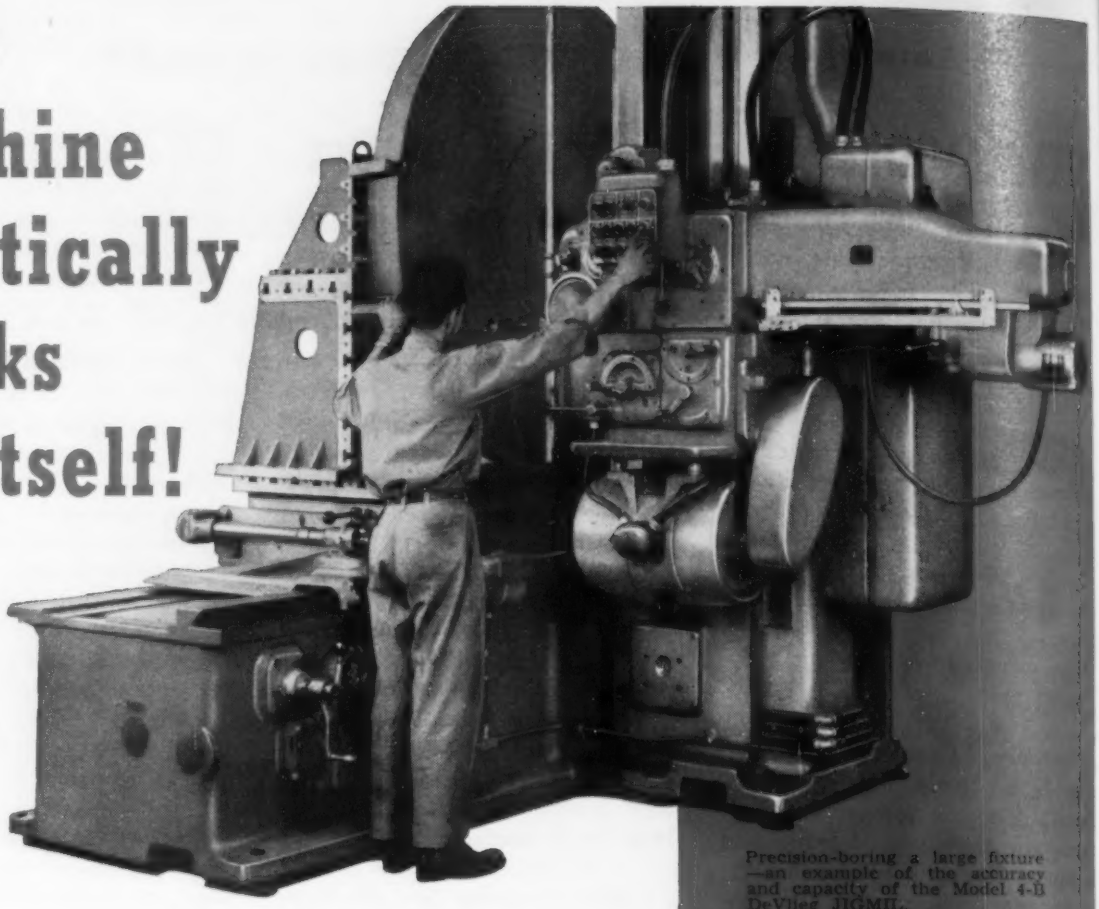
Chevrolet—Re-engineered powerplant, new shock absorbers and carburetor refinements. Variety of new exterior and interior color combinations. Chevrolet claims better hot starting, elimination of vapor locks. The automatic choke replaces the manual choke on Powerglides. The new device employs coil spring thermostat rather than a solenoid.

Hudson — New cars feature hardtop styling. New ornamentation and redesigned body trim. Aluminum head standard on the Hornet. Wasp, with 119-in. wheelbase, is a new line.

THE BULL OF THE WOODS By J. R. Williams

HE WAS LEANIN' ON TH' HOOKS AND HE DIDN'T EVEN SEE TH' GUYS WAITIN' FOR TH' CRANE, BUT SOMETHIN' TOLD HIM TO GET OFF THERE QUICK -- THAT MUST BE INSTINCT!
NO, NOT INSTINCT --IT'S MEMORY! IT JUST CAME TO THE BULL THAT WHEN HE WAS A WORKMAN HE'D NEVER CALL TH' CRANE IF TH' BOSS WAS USIN' IT!
2-1
JRWILLIAMS
T. M. Reg. U. S. Pat. Off.
THAT OLD FEELIN'
Copr. 1952 by NEA Service, Inc.

This machine practically thinks for itself!



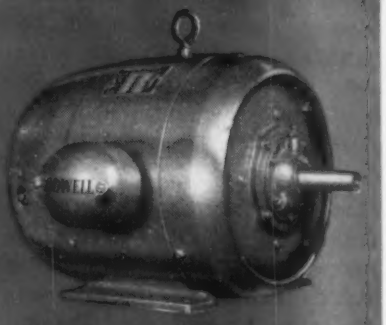
Precision-boring a large fixture —an example of the accuracy and capacity of the Model 4-B DeVlieg JIGMIL.

It's uncanny the way this DeVlieg JIGMIL handles the most complex boring and milling operations *automatically*, simply by pushing a button on the control panel.

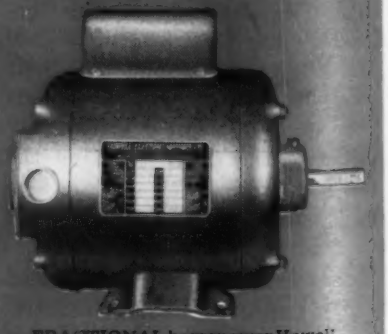
For example — by simple push button control, the workpiece is positioned both horizontally and vertically, and holes are automatically spaced and bored to exact tolerances. A unique index table allows machining of parts from four sides without rechucking. A power tool lock permits locking or releasing cutting tools in a few seconds.

Howell engineers worked closely with this manufacturer to make sure each of the five Howell motors fitted its job exactly. The three 2-speed and two single-speed Howell motors make a vital contribution to the remarkable efficiency of this machine.

Howell will supply the same high degree of engineering skill and experience to your problems. You are assured of quality motors designed for your specific requirements, built to stand up under the heaviest production loads. May we handle your electric motor needs?



HOWELL Type K Motor. Totally enclosed, fan-cooled. Sealed against dust, dirt, fumes and moisture. Sizes from 3 to 150 H.P. at 1800 RPM. For horizontal or vertical mounting.



FRACTIONAL horsepower Howell motors, both single and polyphase, are usually carried in stock. Furnished in standard NEMA frames as either open or totally enclosed types.

HOWELL Red Band MOTORS

HOWELL MOTORS

HOWELL ELECTRIC MOTORS CO., HOWELL, MICH.

Precision-built industrial motors since 1915

Auto Wreckers Ignore NPA Order

Only about 50 pct have filed inventory reports . . . But lists far from accurate . . . Tonnage light so far . . . Smog controls a headache . . . Steel strikes cut output—*By R. T. Reinhardt.*

If auto wreckers throughout the country aren't complying with National Production Authority order M-92 any more faithfully than those in California, there should be some national fireworks.

With the deadline long passed, it is estimated that only about 50 pct of known wreckers have filed their initial inventory reports.

In fairness, it should be pointed out that lists of wreckers in NPA hands are far from realistic. These lists have been made up from records showing who has applied to the state for a wrecking permit and include small garages which want wrecking privileges for occasional use, but which actually aren't in the business. Hence, there is much deadwood.

Not Swamped Yet — Scrap buyers haven't as yet been overwhelmed by heavy tonnages of wrecked cars and don't expect too much until spring. Wreckers are currently heavily loaded with jalopies whose owners don't want to pay the 1952 license and tax fees. It will be several months before this glut reaches dealers and openhearths.

Body burning is still a controversial subject between wreckers and city and county officials. In the San Francisco Bay area the problem isn't too difficult because of climatic conditions, but in Los Angeles County with its strict smog control regulations there is constant friction. Apparently someone is going to have to ease the pressure on burning control before jalopies will flow freely to the steelmaking furnaces. Best guess is that demand for steel will outweigh more aesthetic considerations.

Scrap is unquestionably on the top of the priority list of western steel producers. Not faring too badly now, they know that allocations eastward could overnight wreck their production schedules. Forecasts of a softening demand for steel in the third quarter don't change their thinking—the West is growing too fast in their estimation to permit anticipation of lessening demand here regardless of the national picture.

Not in the Clear — Even though Bethlehem Pacific Coast Steel Corp. has switched from openhearths to electric furnaces, the company is still harassed by smog control regulations of Los Angeles County.

Bethlehem has applied for another variance until tests on smog control hoods over their electric furnaces are completed. So far it has been a costly operation trying to control furnace emissions. One type of hood burned out in 2 days. Currently a complicated, water-cooled and refractory-lined hood is working satisfactorily under temperatures ranging up to 2400°F.

"Why, I just *might* be able to find a connection who *might* have a friend who could find some forging billets."

Foundries have also had their share of trouble from smog control officials. They are currently interested in the success Dayton Foundry of Los Angeles has had with a new type of bag which collects particulate material. Known as the Hersey Bag, it employs a device to spray air on the surface of the bag to keep it free of dust and eliminates need for shaking and resultant wear and tear.

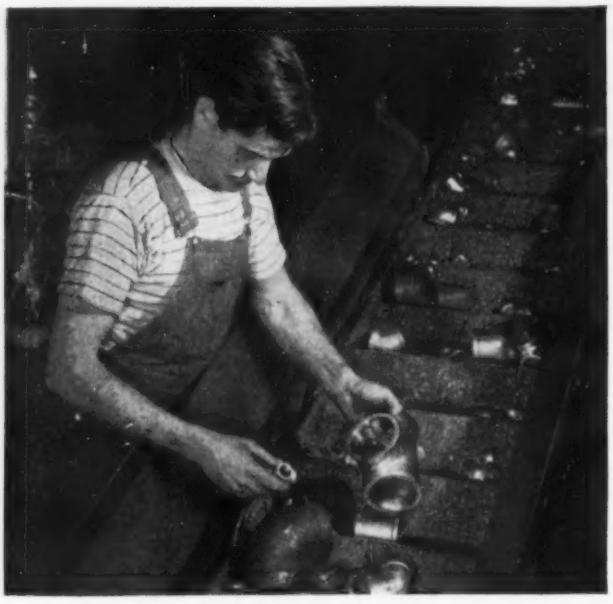
Box Score — Organized labor is losing friends in California because of the 3-week strike of 1000 workers in the Torrance plant of the Columbia - Geneva Div. of U. S. Steel which has cost about 12,000 tons of badly needed steel, and the 24-hour "sympathy" strike of 3600 men at the Pittsburg, Calif., plant which lost 1300 tons of steel.

Alden G. Roach, president, Columbia-Geneva Div., has asked government agencies to intervene. While some observers believe these work stoppages are a result of impatience over settlement of present national wage negotiations, there is reason to believe that the cause goes deeper and is more significant than appears on the surface.

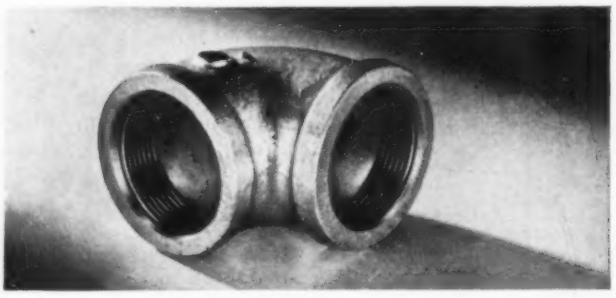
Big Squeeze — Reynolds Metals Co. at Phoenix, Ariz., will soon be in the unique position of being able to extrude an aluminum billet 32 in. in diameter, 70 in. long and weighing 5000 lbs. as a result of an Air Force contract involving a 400,000 sq ft building to house one 8000-ton and one 12,000-ton capacity presses.

This plant, built during World War II, was considered a white elephant in the aluminum extrusion field. Reynolds management has brought it into the profit column and in the West it is deemed one of the most important of aircraft production components. This new equipment will enable Reynolds to extrude airframe parts which previously had to be fabricated from a multitude of parts.

A PIPE FITTING MANUFACTURER had trouble with a straight cutting oil. It made the floors slippery; was suspected of causing skin irritations; discolored the fittings. In addition, a special cleaner and rust preventive had to be used.



CHANGING TO S.E.C.O. brought excellent results. This "Job Proved" emulsifying cutting oil kept the fittings from discoloring, minimized complaints about skin troubles, made floors safe, eliminated the need for a special cleaner and rust preventive.



OPERATIONAL DATA. Machine: 2" automatic tapping machine • Metal: Malleable iron • Operation: Thread and chamfer 1½" 45° elbow • Cutting Speed: 75 SFM • Tools: High speed • Production: 306 pieces per hour • Cycle Time: 11¾ sec.

S.E.C.O. REPLACES THREE PRODUCTS; REDUCES COSTS, MAKES SHOP CLEANER, SAFER

Ten years ago, one of the largest manufacturers of pipe fittings was using a straight cutting oil that proved to be a production headache. It made floors slippery, discolored the fittings, even was blamed by the operators for causing skin ailments.

The company overcame these problems—with extra benefits for good measure—by changing to Sunoco Emulsifying Cutting Oil. S.E.C.O. performed as a quality cutting oil is expected to, and eliminated the need for two costly supplementary products: a special alkali cleaner and a rust preventive. Sprayed on the parts conveyed through the washers, S.E.C.O. left a film that gave complete protection against rusting. Oil costs were reduced to an amazing extent; floors were safe; complaints about skin irritations were minimized and shop morale improved. The pipe fittings, free of discoloration, commanded a better position saleswise. The company standardized on S.E.C.O. and has been using it ever since.

In all machine shop operations, on both ferrous and nonferrous metals, Sun Emulsifying Cutting Oil is definitely superior. That's why more S.E.C.O. is used than all other brands of emulsifying cutting oil combined. For more operational data on typical S.E.C.O. applications, write for a copy of the new "Cutting and Grinding Facts." Department IA-6.

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SUNOCO®

Stall Bullard Orders to Restudy Needs

NPA tells GM to hold up plans for $69 million worth of Bullard lathes . . . Must make sure Air Force needs all machines . . . Still ponder riddle of secret defense list—*By G. Elwers.*

The NPA has told General Motors to hold up its plans to build $69 million worth of vertical turret lathes under subcontract from Bullard, until it determines if Air Force contractors really need all those machines.

There is evidence that the Air Force has greatly overestimated its need for these tools, says NPA. So it wants General Motors, which is completing tooling to build some 500 of the lathes, to hold off pending further investigation.

Optimistic on Funds?—It is too early to do more than speculate, but there is a possibility that this presages a substantial crack in the machine tool situation. If the Air Force has seriously overestimated its need for Bullards, could it not have overestimated on other types of tools, too?

Besides, there is evidence that the Air Force has not only overestimated its needs, but also has been over-optimistic about how much money it is going to get from Congress. The budget for fiscal 1952, as presented to Congress recently by the President, does not include funds to enable the Air Force to increase its authorized size to 140 groups.

Slower Expansion—In fact, observers say, the money projected for the Air Force in 1952 is not enough to permit it to continue expansion at its present planned rate.

Of course there is usually a considerable difference between a President's budget recommendations and what Congress actually votes. The Air Force eventually may get more money. But if it doesn't get all it planned on, the present pressure on machine tool builders may be somewhat relieved.

Another development of possible significance is the cancellation of a Fairchild contract to build cargo planes. Not only are some 200 machine tools released now for someone else, but this project will order no more.

Urgent but Secret — The NPA and the Munitions Board still haven't figured out what they are going to do with their classified Defense Dept. master urgency list.

The object of this list is to enable scheduling of machine tool production so that the most urgent defense projects get their tools first. The NPA wants to set up a system similar to the E-1-b plan which worked well in World War II days.

But so far no plan has been worked out because the urgency list, being classified information, can't be revealed. It is difficult to see how machine tool builders can be told which projects should get their output first, without revealing what is on this list.

"You're more interested in my production than in me."

Dragging Feet — The industry recommended a plan like E-1-b to the Munitions Board back in October, 1950. It has been asking for it ever since. But the military services have dragged their feet, saying they couldn't determine their machine tool needs in advance, nor be definite on the relative urgency of different projects.

Recently the Air Force made up a short list of its own, but there still was nothing to indicate relative priority between projects of the different services.

NPA Stymied — A couple of months ago, the Munitions Board finally laid down the law to the Armed Forces to furnish data for an overall urgency list by January. That is the list which is now in NPA's hands.

And that is the list which NPA, at present, does not know how to apply to set up a distribution plan, because it is classified.

Orders Rise — The new order index of the National Machine Tool Builders' Assn. bounced up to a level of 416.8 in December from the 1951 low of 330.5 registered in November. The December level is still lower than all but 3 months of 1951, but is much higher than September, October, and November, when this index of the month's volume of new orders was in a decline.

In December the shipment index continued its climb, making its sharpest gain of 1951 by rising from 225.6 in November to 245.8 in December.

As a result of this sharp increase in shipments, the NMTBA ratio of unfilled orders to demonstrated production rate dropped in December to 18.7:1.

MAGNESIUM

and the

problem of

DESIGN

in your product

IN PRODUCT DESIGN, magnesium offers the outstanding advantage of a high strength/weight ratio. This single factor has many interesting applications.

Suppose your product . . . up for re-design . . . has met a sales penalty of excessive weight. In re-designing you have a choice of several metals. But only one . . . magnesium . . . can offer you the best combination of light weight, strength and rigidity.

Perhaps your product requires additional parts to increase its efficiency, its saleability. Yet the addition of those parts may mean undesirable weight. By re-designing with magnesium, many manufacturers have found it possible to add improvements without increasing weight.

Another type of design advantage is often utilized where no weight saving is necessary. Because of its strength/weight ratio, magnesium makes possible greatly simplified construction with resultant lower costs. Recently a large, complex structure was redesigned in magnesium with a reduction of 69% in the number of pieces required and reducing the number of fasteners 62%.

Magnesium offers real flexibility in design with a variety of alloys possessing characteristics of strength, toughness, machinability and corrosion resistance. Fabricated magnesium is produced in all common forms: castings, forgings, extrusion, sheet and plate; and can be economically worked by all standard shop practices.

This Little "Pig" Was Drafted . . .

Today, magnesium like many other metals, is a tremendously important part of our defense effort, particularly where light weight is a specification in design. As a result, the supply for commercial uses is often limited. But tomorrow, magnesium promises new horizons in the field of metal supply. *The seas, at our own shores, can provide 100 million tons per year for a million years without significantly reducing the supply.*

THE DOW CHEMICAL COMPANY

Magnesium Department • Midland, Michigan

New York • Boston • Philadelphia • Atlanta • Cleveland • Detroit • Chicago
St. Louis • Houston • San Francisco • Los Angeles • Seattle
Dow Chemical of Canada, Limited, Toronto, Canada

The Iron Age

SALUTES

Gwilym A. Price

He envisions a new era in home comfort, appliance use . . . He's preparing to meet these markets.

EARLY in 1951 appliance sales slowed. The trade press reported dealers' stocks were loaded and manufacturers' inventories were bulging. The outlook was for manufacturing cutbacks—regardless of controls.

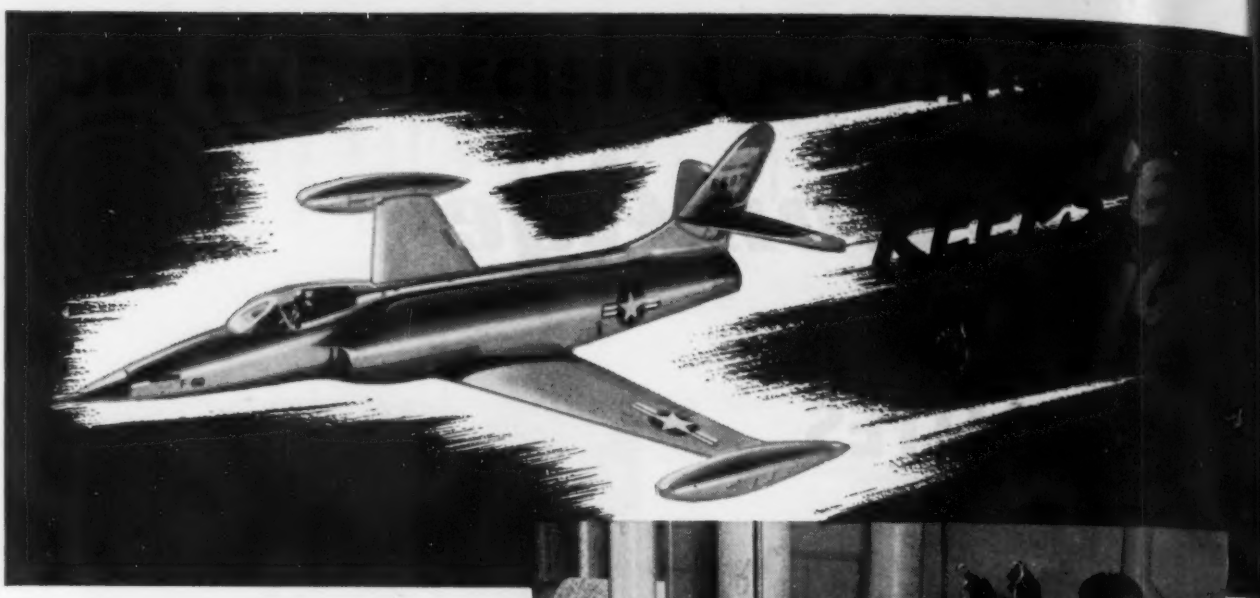
But Gwilym Price, president of Westinghouse Electric Corp., was looking much further ahead than 1951, or even 1952. At a press conference in New York he quietly dropped a bombshell. He coolly told the trade press his company planned to expand its appliance division 100 pct.

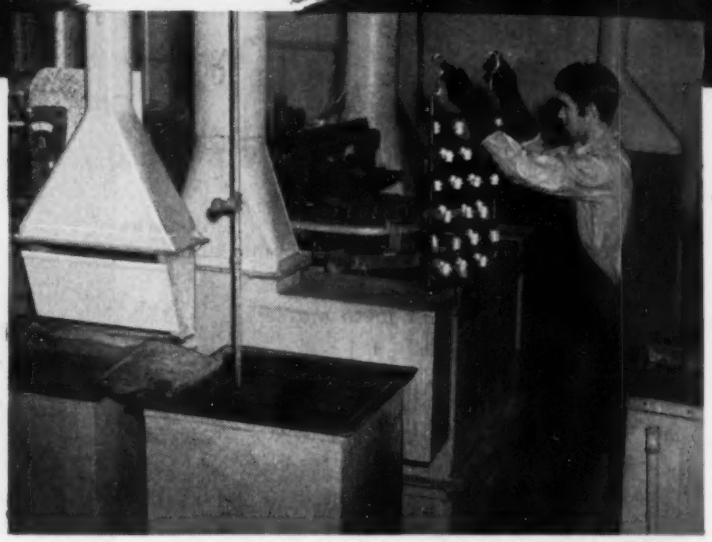
Then he proceeded to answer all questions of incredulous reporters. Yes, he expected a tough selling job ahead. They'd have to sell like they'd never sold before. They'd have to design new and better products. They were going after whole new markets that would mean greater electrification and more comfort in the home—and more business for Westinghouse.

Industry needs more men like Gwilym Price. Men with vision, and courage to do something about it—even in the face of adversity. He realizes that no company can maintain the status quo; it expands, or it withers on the vine. The same philosophy of growth is being applied to other divisions of his company. It has a big part in defense, including the first atomic engine for submarines.

Mr. Price wears his 56 years lightly. He is dignified when the occasion demands. But he's more likely to give you a warm, boyish grin.

He joined Westinghouse as vice-president in 1943, became president in 1946. Despite a heavy work load, he manages to squeeze in recreation which usually consists of skeet and trap shooting, fishing, hunting, or bridge.





SCINTILLA MAGNETO DIVISION OF BENDIX AVIATION CORPORATION USES UDYLITE EQUIPMENT AND PROCESSES TO SAFEGUARD VITAL AIRCRAFT IGNITION PARTS

Udylite plating installation at Scintilla Magneto Division of Bendix Aviation Corporation showing ignition connectors of the Lockheed F-90 Fighter being processed.

Spark of life to military aircraft—both jet and propeller driven—is the electrical system. Failure can be fatal, so the Scintilla Magneto Division gives the metal of ignition connectors a protective coating against rust and corrosion with Udylite plating equipment and processes.

Here you have an example of how Udylite is helping beat the ploughshares of peace into the swords of war. In defense weapons, ranging from side arms to submarines, you'll find that Udylite precision-plating is making an important contribution to national defense.

If you have a defense job that involves metal finishing, your Udylite Technical Man can lend you the experience gained in World War II when Udylite developed new machines and methods for bettering the plating of the tools of war. Call him today and state your problems. Or write direct to *The Udylite Corporation, Detroit 11, Michigan.* There's no obligation.

THE Udylite CORPORATION
DETROIT 11, MICHIGAN

PIONEER OF A BETTER WAY IN PLATING

The Iron Age INTRODUCES

Marshall H. Wagman, elected president, AMERICAN TOOL & SUPPLY CO., Pittsburgh. **Joseph Wagman,** former president, named chairman.

Kenneth C. Towe, elected president, AMERICAN CYANAMID CO., New York. He succeeds the late **Raymond C. Gaugler. Howard Huston,** vice-president, elected a director.

F. S. Elfred, appointed executive vice-president; **B. E. Bassett,** appointed vice-president for production, and **M. W. Acker,** appointed a vice-president, OLIN INDUSTRIES, INC., New York.

Michale J. Kearins, president, United Drill & Tool Corp., elected president, J. H. WILLIAMS & CO., Buffalo. Mr. Kearins succeeds **A. Donally Armitage** who has been elected chairman of the board.

Charles E. Boak, appointed assistant to the president, PLUME & ATWOOD MFG. CO., Waterbury, Conn.

A. P. Richards, elected president and director of laboratories, WILLIAM F. CLAPP LABORATORIES, INC., Duxbury, Mass. He succeeds the late Dr. William F. Clapp.

Carlton H. Winslow, elected vice-president in charge of sales, CUNO ENGINEERING CORP., Meriden, Conn.

Arthur R. Hines, elected a commercial vice-president, Marketing Services Div., GENERAL ELECTRIC CO., New York.

Arthur H. Rice, appointed vice-president in charge of production, G. A. GRAY CO., Cincinnati.

James T. Barnard, appointed assistant manager, Detroit branch, Pittsburgh Crucible Div., CRUCIBLE STEEL CO. OF AMERICA, Pittsburgh. **Harry I. Askew, Jr.,** appointed salesman, Chicago branch.

C. C. Morgan, promoted to assistant general superintendent, Pittsburg Works, U. S. STEEL CO., Pittsburg, Calif. Mr. Morgan succeeds **D. E. Rice,** appointed general superintendent, Torrance, Calif., Works. **J. P. Newman,** assistant superintendent, sheet finishing, replaces Mr. Morgan as superintendent.

David S. Burnett, joined DETROIT STEEL PRODUCTS CO., Detroit, as assistant sales manager, Spring Div.

W. J. MacNeill, appointed vice-president in charge of operations, BADGER MALLEABLE & MANUFACTURING CO., South Milwaukee, Wis.

Frederick K. Pulsifer, appointed district manager, Rochester, N. Y., office, CHASE BRASS & COPPER CO., Waterbury, Conn. Mr. Pulsifer, will replace **Charles L. Moseley** who will be transferred to the general sales offices in Waterbury.

Samuel F. Green, fleet and equipment sales supervisor, appointed regional manager WILLYS-OVERLAND MOTORS INC., Toledo, Ohio.

John M. Otter, former vice-president and general sales manager, PHILCO CORP., Philadelphia, becomes vice-president and general manager, Refrigeration Div.; **Thomas A. Kennally,** becomes vice-president on the executive staff and chairman of the distribution committee; **Raymond B. George,** appointed corporate vice-president, Merchandising; **Frederick**

WILLIAM A. JAHN, elected vice-president in charge of sales, Inland Steel Products Co., Milwaukee.

LOUIS BUCHMAN, elected vice-president and director, Kennecott Copper Corp., Salt Lake City. He will continue to supervise the western mining divisions.

JOSEPH V. HUTELMYER, appointed vice-president in charge of engineering, Cutler Metal Products Co., Camden, N. J.

D. Ogilby, named vice-president, Television and Radio Div.; **John Kuneau,** chairman of the newly formed merchandising committee; and **John L. Utz,** becomes national sales manager of television.

Elliott C. Youngberg, appointed assistant manager, traffic department, INLAND STEEL CO., Chicago, and **John G. Ploehn,** appointed manager of business procedures.

C. G. Bunting, former secretary and assistant treasurer, succeeds **E. R. Ailes,** who has retired, as secretary-treasurer; **A. E. McKenzie** succeeds **R. W. Weed** as Eastern Regional sales manager; and **Harold Gilecek** succeeds **J. P. Donohue** as traffic manager, DETROIT STEEL PRODUCTS CO., Detroit.

A. H. Stromeier, appointed sales engineer, Tubular Div., AETNA-STANDARD ENGINEERING CO., Pittsburgh.

Wilbur G. Smith, promoted from assistant superintendent of strip mill to assistant general manager, Lackawanna Plant, BETHLEHEM STEEL CO.

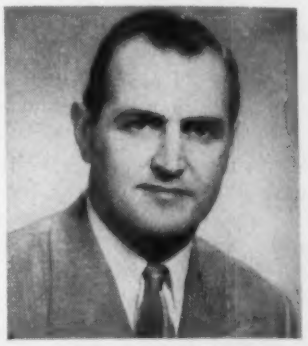
C. E. Cromwell, appointed sales manager, Commercial Div., DE LAVAL STEAM TURBINE CO., Trenton, N. J. **J. H. Metzgar,** appointed sales manager, Standard Products Div.

B. C. Flett, appointed plant engineer, Shipbuilding Div., BETHLEHEM PACIFIC COAST STEEL CORP., San Francisco. He succeeds **K. M. Paulson** who has been promoted to manager of real estate.

Fred H. Kroeger, appointed sales manager in charge of power brakes and devices, Marvel-Schebler Products Div., BORG-WARNER CORP., Chicago.

Earl W. Cunningham, named general manager, Industrial Heating Dept., GENERAL ELECTRIC CO., Schenectady.

D. V. SHERLOCK, recalled as acting manager, Blaw-Knox Div. Blaw-Knox Co.



WALTER L. LONGNECKER, named general superintendent, Cuyahoga Works, American Steel & Wire Div., U. S. Steel Co., Cleveland.

ADIN B. CAPRON, named chief engineer, Tubular Products Div., Babcock & Wilcox Co.

ARTHUR W. THORNTON, appointed assistant general superintendent, National Works, National Tube Div., U. S. Steel Co.

SEND FOR
WILMOT CONVEYOR BULLETIN 502

As Originators of Rivetless Chain, Wilmot Offers Widest Choice of Chain Sizes and Conveyor Attachments

The booklet contains engineering data on rivetless chain in pitches from 3" to 10½" and working loads from 3,000 to 130,000 lbs.; of drop-forged steel, alloy or cast chrome-manganese steels. Wilmot not only stocks the largest choice of chain sizes, but also furnishes the widest range of other conveyor parts: sprockets, traction wheels, flights, take-ups, shafting, bearings and trough in cast iron, ductile iron, carbon or chrome-manganese steel to fit the application. See why an increasing number of leading firms are cutting "down" time by depending on Wilmot for all conveyor replacement parts.

WILMOT ENGINEERING CO. HAZLETON, PA.
Foundry and Shops: WHITE HAVEN, PA.

the iron Age
FOUNDED 1855
Technical Articles

ORDNANCE is buying these aluminum products

Along with other parts and components, the new "Walker Bulldog" tank has aluminum turret flooring (inset).

Like the other armed services, the Ordnance Corps needs a wide assortment of parts and assemblies made up in whole or in part of aluminum. This list of cast, wrought, extruded and machined items, prepared specially for The Iron Age, includes tank parts, ammunition components, gun materials.

IN the Ordnance Corps, although for different reasons, aluminum is a weight saver just as in a warplane. A foot soldier resists fatigue and maintains his fighting power longer the less poundage he has to carry. If a tank can cut

Ordnance's aluminum needs (continued)

weight with aluminum, it can move faster, fight better and its armament can be "beefed-up" more.

So the listing below of the Ordnance Corps' aluminum needs take many forms. For items such as rocket launchers, tank components, shell fuses and guns, aluminum alloy stampings, extrusions, castings and other wrought and fabricated parts are now being purchased.

ALUMINUM COMPONENTS ORDERED BY ORDNANCE

TANK, AUTOMOTIVE

	Aluminum Specification	Type of Aluminum	Approximate Weight, lb.
Castings			
Gear housings, covers	QQ-A-601, Cl 3, 4, 10 or 17 QQ-A-596, Cl 4, 6, 8 or 11	356, 195, 355, 40E	3-25
Covers, hydraulic systems	QQ-A-601, Cl 3, 4, 10 or 17 QQ-A-596, Cl 4, 6, 8 or 11	356, 195, 355, 40E	1-10
Brackets, oil cooler	QQ-A-601, Cl 3, 4, 10 or 17	356, 195, 355, 40E	1-10
Intake air, carburetor	QQ-A-601, Cl 2, 8 or 9 QQ-A-596, Cl 1, 5, 11	43, 108, 113	5
Housing, generator	QQ-A-601, Cl 3, 4, 10 or 17	356, 195, 355, 40E	5-10
Elbows, electrical	QQ-A-601, Cl 17	40E	¼-1
Tools aligning	QQ-A-601, Cl 2, 8 or 9	43, 108, 113	3-10
Housings, lamp	QQ-A-591, Cl 5, 10 or 11	85, A380, 380	1-2
Handle, fire control	QQ-A-591, Cl 5, 10 or 11	85, A380, 380	1-2
Pistons, fire control	QQ-A-591, Cl 5, 10 or 11	85, A380, 380	¼-1
Deep Drawn			
Pans, oil	QQ-A-318, QQ-A-327	52S, 61S	1-5
Covers	QQ-A-318, QQ-A-359	52S, 3S	½-5
Extrusions			
Ladder	QQ-A-354 & QQ-A-327	24S, 61S	5-25
Engine rails	QQ-A-354	24S	10-50
Framework, structural	QQ-A-354, QQ-A-327 QQ-A-261, QQ-A-266	24S, 61S 24S, 61S	10-50
Forging			
Travel lock	QQ-A-367, Cl 5	Al, 1 Si, 1 Mn, 5 Cu	5-10
Pump, housing (hydraulic)	QQ-A-367, Cl 5	Al, 1 Si, 1 Mn, 5 Cu	2
Brackets	QQ-A-367, Cl 3 or 8	Al, 1 Si, 53S	¼-5
Pistons, hydraulic	QQ-A-367, Cl 3 or 8	Al, 1 Si, 53S	¼-1
Machined Parts			
Connectors, electrical	QQ-A-354, QQ-A-365	24S, 11ST	¼-½
Ferrules, electrical	QQ-A-354, QQ-A-365	24S, 11ST	¼-½
Nuts, electrical	QQ-A-354, QQ-A-365	24S, 11ST	¼-½
Adapters, electrical	QQ-A-354, QQ-A-365	24S, 11ST	¼-½

Loading and aiming a 3.5-in. "bazooka" in Korea. Aluminum is used for several parts in the weapon.

LAUNCHER, ROCKET, 3.5 IN. (M20B)

	Aluminum Specification	Type of Aluminum	Approximate Weight, lb.
Castings			
Trigger	QQ-A-591	*	0.09 gross
Leg, bipod	QQ-A-596	*	0.83 gross
Block, slide	QQ-A-601	*	0.42 gross
Barrel, rear			9.09 gross
Barrel, front			7.14 gross
Latch	QQ-A-591	*	0.012 gross
Yoke, lower	QQ-A-601	*	0.62 gross
Extrusions			
Body, sleeve	WW-T-785	24S	0.13 net
Tube, conduit	WW-T-785	24S	0.038 net
Body, monopod	WW-T-785	24S	0.10 net
Machined Parts			
Adapter	QQ-A-351	17S	0.07 net
Swivel, sling	QQ-A-351	17S	0.01 net
Cap	QQ-A-351	17S	0.07 gross
Nut, adapter	QQ-A-351	17S	0.079 gross
Sleeve, adapter	QQ-A-354	24S	0.14 gross
Bushing, trigger	QQ-A-351	17S	0.009 gross
Nut, monopod leg	QQ-A-351	17S	0.02 gross
Leg, monopod	QQ-A-351	17S	0.34 gross
Stamping			
Handle, barrel latch	QQ-A-355	24S	0.01 net
Link, leg	QQ-A-355	24S	0.06 net
Trip, bipod	QQ-A-355	24S	0.04 net
Housing, barrel latch	QQ-A-355	24S	0.053 gross
Foot, monopod	QQ-A-355	24S	0.066 gross
Stock	QQ-A-355	24S	0.367 gross
Guard, trigger	QQ-A-355	24S	0.13 gross

MOUNT, TRIPOD (FOR M74, M77)

	Aluminum Specification	Type of Aluminum	Approximate Weight, lb.
Castings			
Dial, traversing	QQ-A-601	*	1.16 gross
Head, front nut	QQ-A-601	*	2.10 gross
Foot, front leg	QQ-A-601	*	1.32 gross
Foot, rear leg	QQ-A-601	*	1.32 gross
Head, rear leg	QQ-A-601	*	1.32 gross
Socket, tripod	QQ-A-601	*	1.31 gross
Body, cradle	QQ-A-601	*	4.48 gross
Extrusions			
Tube, rear leg	WW-T-785	24S	0.44 gross
Tube, front leg	WW-T-785	24S	0.30 gross
Tube	WW-T-787	52S	0.13 gross
Flange	WW-T-789	61S	0.03 gross
Tube, screw housing, rear	QQ-A-325	61S	0.05 gross
Tube	QQ-A-315	52S	0.06 gross

MOUNT, TRIPOD (FOR M74, M77) (Continued)

	Aluminum Specification	Type of Aluminum	Approximate Weight, lb.
Machined Parts			
Pin, leg	QQ-A-351	17S	0.015 gross
Knob, elevating	QQ-A-354	24S	0.92 gross
Knob, traversing	QQ-A-354	24S	0.74 gross
Washer, slot filler	QQ-A-327	61S	0.05 gross
Stampings			
Cap, dust, front	QQ-A-318	52S	0.14 gross
Flange	QQ-A-315	52S	0.02 gross
Plate, main	QQ-A-359	3S	0.015 gross

AMMUNITION COMPONENTS

	Aluminum Specification	Type of Aluminum	Approximate Weight, lb.
Castings			
Shell parts	QQ-A-591	*	0.450
Fuse parts †	QQ-A-591	*	0.1510
Mortar parts	QQ-A-351	17S	0.0182
			0.193
			0.0824
			0.420
Drawn			
Fuse parts †	QQ-A-318	52S	0.270
Detonator parts			0.161
Extrusions			
Burster	WW-T-788	3S	0.161
Machined Parts			
Shell parts	QQ-A-351	17S	0.0920
Fuse parts †	QQ-A-591	*	0.520
Igniter parts	QQ-A-591	*	0.450
	QQ-A-561	2S	3.420
			0.427
			0.1510
			0.0182
			0.0198
			0.193
			0.0821
			0.420
Stampings			
Fuse parts	QQ-A-351	17S	0.004
Igniter parts †	QQ-A-354	24S	0.0545
Shell parts	QQ-A-561	2S	0.0031
			0.068
			3.420

* Type of aluminum depends on specification class and/or requirements involved with specific items.
† Specification numbers and unit weights do not necessarily apply to item description on same line. Several specifications and unit weights may apply to the same item.

NEW BOOKS

"Surface Defects in Ingots and Their Products," provides uniformity in naming of ingot defects and offers a systematic approach to the diagnosis of their causes. The Iron and Steel Institute, 4 Grosvenor Gardens, London, S.W. 1. $3.50. 51 p.

"Work Measurement Manual," by Ralph M. Barnes. Methods by which the ability of time study men to set time standards, and by which the accuracy and consistency of such standards may be measured are described. Investigations conducted by the author as long as 20 years ago indicated the necessity for periodic audits of time study procedures within an organization. This book, developed from those studies, provides many answers which will enable continued development of time study as a useful research tool. Wm. C. Brown Co., 915 Main St., Dubuque, Iowa. $4.75. 297-p.

"Typical Microstructures of Cast Iron," is intended as a practical aid for foundry engineers and metallurgists. The book presents for reference and comparison a series of photomicrographs of the principal types of cast iron normally encountered. British Cast Iron Research Assn., Alvechurch, Birmingham, England. $2.10. 55 p.

"Oxygen Cutting," by George V. Slottman and Edward H. Roper. A detailed picture of oxygen cutting, a now widely accepted manufacturing method, with techniques used and old and new applications are presented. Both research worker and practical operator will find much valuable material here. Some recent advances are underwater cutting, rock drilling, electronic tracers for cutting machines, and developments in heavy cutting. McGraw-Hill Book Co., 330 West 42nd St., New York 18, N. Y. $6.50. 407 p.

POWER TRANSMISSION

through chain drives

by John E. Hyler
John E. Hyler & Associates
Peoria, Ill.

No. 2 of a series

Roller and silent chain drives have useful application where positive drive with no slip is required. They are particularly useful on machine tools. Belt tension need not be high, which eases bearing wear. Silent chain for over-and-under use, and variable-speed chain transmissions, are available. Shock absorbing properties are limited.

MODERN chain drives are particularly well adapted for solving many power transmission problems. A good chain drive, correctly proportioned and installed, will prove highly efficient, and will provide an economical means of power transmission. The better one understands a chain drive, the greater is the efficiency under which he will be able to operate it.

A chain drive can never be used where full shock-absorbing properties are necessary. However, a properly-installed chain drive will not transmit the full amount of shock from one sprocket wheel to the other. The very large number of coupled joints in the chain will automatically absorb part of it. The more thoroughly a driving chain is kept lubricated, the greater is the cushioning effect it can provide.

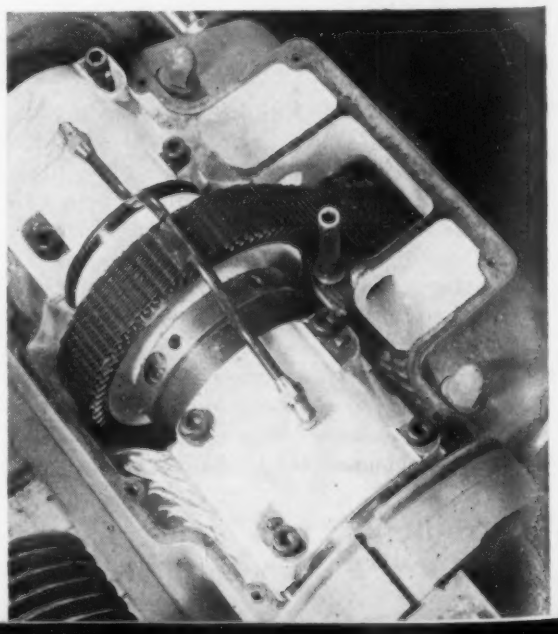
Where a chain drive must be used, as where synchronization or timing is involved, as part of a machine in which severe shocks may occur, it is possible to install a two-piece sprocket fitted with a shear pin. The shearing resistance of the pin is made low so it will break before damage is done to any other part of the mechanism. The drive can be restored to service simply by installation of a new shear pin.

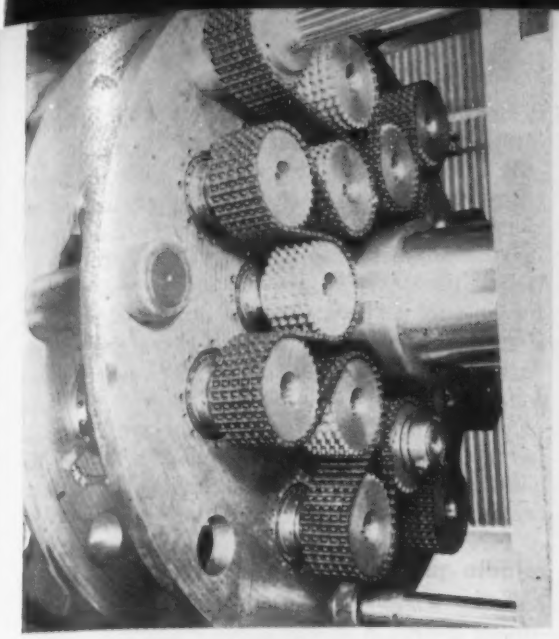
The particular diameter of the pin need not determine resistance to shearing. A pin of any suitable diameter may be circumferentially ground with a groove. This makes a small-diameter neck where the pin will break first. Thus the same diameter of pin may be used for different degrees of strain which it may be considered safe and consistent to impose on given mechanisms, by grinding different grooves.

A few pintle-chain and detachable-link-chain drives are still in use. But most interest is now manifested in roller chain and silent chain.

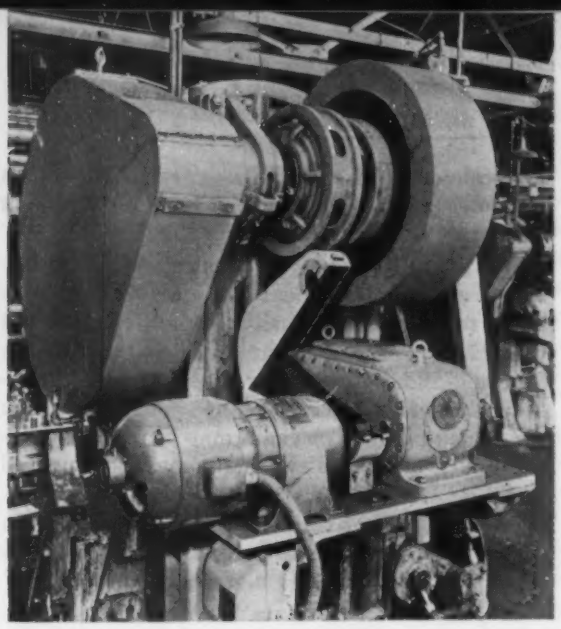
Roller chain is versatile. The same type of roller chain employed for ordinary drives may also be run over and under any desired number of sprockets, regardless of their placement. This makes it possible to solve many intricate drive problems, where a drive must be positive to all sprockets concerned.

TYPICAL silent chain drive, on machine tool. Chain is 2½ in. wide, ½-in. pitch. Machine is tool grinder.





QUINTUPLE width precision steel roller chain drive on special 14-spindle machine tool. Single chain drives the various spindles at speeds from 200 to 1200 rpm.



PUNCH PRESS drive has electro-hydraulic prime mover, left foreground, silent chain drive to variable-speed unit, right. Unit utilizes silent chains in its mechanism.

It is entirely possible to apply a roller chain to fractional-hp drives. They are also employed, in multiple-strand type, on drives of very high horsepower. Roller chains are quite often employed for a first-reduction drive from a motor, though they hardly compete with silent chain drives in this location. They are found on countless intermediate drives, for which they are more particularly adapted. Widely-separated shafts in a machine may be synchronized through use of roller chain when no other workable method appears available.

The general range of roller chain pitches is from ⅜ in. to 2½ in., though larger pitches may be obtained on special order.

Roller chain is available in multiple-strand chains up to and including 12 strands. With multiple-strand chains, it is possible to use chains of short pitches on drives of high horsepower.

Chain drives need little room

Roller-chain drives can be applied on practically any length of drive, providing other particular characteristics of the drive will permit its use. Where short-pitch chain is used, sprocket diameters may be quite small. This makes it possible to use a roller chain drive in some instances where there is hardly room to employ other types of drive.

Some roller chains are made with riveted pins. Others have headed pins, secured by cotters on one end. Cottered chain is quite easily disconnected for adjusting chain length by removing or inserting links or link assemblies.

Where it is necessary to disconnect riveted chain, the heads must first be ground from the rivets. Otherwise the rivet head may damage or dislocate the bushing through which it must pass when it is punched out.

Split roller chain sprockets may be obtained that may be applied to shafts without dismantling a machine. Both the web and the hub of the sprocket are split. There is also a double-duty sprocket available, which is made with a solid hub to which a pair of removable rim sections may be applied.

This is a feature of value when it is wanted to change the speed of a drive at intervals. Sprocket rim sections of different diameters may be applied to the same sprocket hub in this case. Another advantage of a sprocket of this kind is that it makes it easy to remove and replace a roller chain in which there is little slack.

Length easily adjusted

Adjustment of length of a roller chain may be made by removing or adding links. Length adjustments involving distances less than the length of a link cannot be made. Since most roller chain drives do not have fixed centers, it is usually possible to provide proper chain tension by adjustment of centers.

Where centers on a drive are fixed, and an integral number of pitches will not provide proper tension, it is possible to use a chain adjuster. This incorporates one or two idler sprockets bearing against the chain to hold most of the slack out of the running chain. Such adjusters are made in both automatic and manually-operated types. In general, when an idler sprocket is used it should be in the idle span of chain.

A major advantage of a chain over most other kinds of drive is the fact that it is unnecessary to maintain a high degree of tension, because the drive does not depend on a high coefficient of friction. Efficiency in a chain drive is dependent upon a gear-like meshing of the chain with the teeth of the sprocket wheels.

Thus the tension at which a chain is operated is very low, and pressures of shafts in their bear-

ings connected by a chain drive are also low. This promotes long life of such bearings, decreasing both wear and maintenance.

It is possible to apply automatic idlers or chain-length adjusters on silent chain drives, the same as on roller chains. Usually, a silent chain is not versatile in the sense that it may be used as on over-and-under drive, like a roller chain. However, there is a duplex type of silent chain, with very small pitch. This chain may be used on over-and-under drives. Silent chain may be obtained in a smaller pitch than roller chain, a 3/16-in. pitch chain being available. From this, pitches in silent chain graduate upward to and through the same range as that of roller chain.

In general, silent chain is employed on relatively short center distances. Long center distances are practical if chain speeds are slow.

Chains give smooth positive drive

On metal-working machines an important advantage of silent chain is that it delivers power positively, yet smoothly. This is a definite factor in obtaining highly-accurate work on many metal-working machines. The driving force is positive, and is exactly equal to the force needed to do the required work at the tool. It fulfills the necessary requirements as they arise, without any slippage. The consequent steady and uniform cutting rate obtained gives smooth machining. If there are any deflections present in machine parts, those deflections are held constant. As a result, there is no chattering which may be charged against the drive.

Because of the staggering of lengths at each joint in silent chain, it is not possible to naturally couple such lengths together unless the full chain length is made up of an even number of pitches. In most instances, since a silent chain may be run relatively slack, it is easy to arrive at a practical chain length for a given drive. However, if for any reason it is necessary to have an odd number of pitches in a silent chain, an offset coupler may be used. These may be either three or five pitches in length.

Use small pitch chains for high speed

Silent chains incorporating small pitches may be run at far higher speeds than those of large pitches. Moreover, smaller-pitched chains will run more quietly. It is possible to use silent chains which are very narrow, or they may be made up to very great widths.

Silent chain will run in either direction, and its performance is not affected by moisture, cold, or heat. It does not seriously deteriorate if it is idle for a period of time. In consequence, many plants which have long down periods favor use of silent chain. Neverthless, where a silent chain drive is to be down for a long time, it is a good idea to remove the chain from the drive and store it in a bath of lubricating oil. This will not only protect it against rust, but will allow oil to find its way into all the bearing surfaces of the chain.

It is practical to use a silent chain on speed ratios as great as 15 to 1. Where greater reductions or increases than this amount are desirable, it is usually better to obtain it in two steps.

It is necessary to provide some specific means for holding a silent chain in proper lateral position on its sprockets, because there are no side bars on silent chain in the ordinary sense, as are found on a roller chain. One way to retain a chain in proper position is to arrange auxiliary side bar lengths, or side flanges, which will hold the chain to a true path by embracing the sides of the sprocket teeth.

Middle guides used

However, silent chains are often made with middle guides. A middle guide consists of a series of special links placed in a straight line down the center of the chain. The sprockets used with such a chain are provided with an annular center groove extending down through the sprocket teeth and into the sprocket rim. The middle guide of the chain runs in this groove.

It is also possible to apply silent-chain guides to sprockets instead of to the chain. In some cases, sprockets are provided with side plates which extend somewhat above the sprocket teeth.

There are cases in which silent-chain drives are used on independently-mounted electric motors. In cases where there may be a question as to whether such a motor will always remain in true alignment, a special type of chain guide known as a wire flange unit may be employed.

Cases sometimes arise where something special in a silent chain drive may be required. One of these is where it is necessary that electricity will not be conducted by the drive. In such a case, it is possible to use sprockets made of some nonconducting material. One such is a suitable grade of vulcanized fiber.

Variable speed unit uses chain

Most chain drives allow no variation in ratio of speed between driver and driven. There is, however, a chain used as the power-transmitting medium in a variable-speed mechanism. The chain used is both self forming and self pitching.

There are two cone-faced wheels on the input shaft of the mechanism, their conical sides facing one another. There is a similar pair of cone-faced wheels on the output shaft. The conical wheels on one shaft are spread apart as those on the other are drawn together to change the output speed.

Radial grooves are cut in the conical faces of the wheels to provide a gripping surface for the chain. Either the grooves or the metal left standing between the grooves, or both, must be tapered. As a pair of wheels draw together or spread apart, to force the running chain to a higher diameter or allow it to drop to a smaller diameter, the pitch in the chain changes accordingly to accommodate itself to the changing widths of grooves and "teeth" on the wheel faces.

TUNA CLIPPER *Esperito Santo* as she appeared after a recent overhaul. The 500-ton vessel was metallized in 1946.

METALLIZING

cuts marine maintenance costs

By Capt. Fred M. Earle, USN, (retired)
Consultant
Santa Ana, Calif.

Aluminum and zinc sprayed on properly cleaned iron and steel and coated with vinyl sealers are effectively protecting steel fishing boats from salt spray corrosion. Maintenance costs are lower. Entire envelopes of ships are being sprayed during construction to protect steel hull and deck plates.

New records for corrosion protection are being established among the fleet of steel tuna fishing vessels operating out of San Diego, Calif., as a result of wider use of sprayed metal. Used with vinyl coatings as a sealer, or paint for appearance sake the metal coatings are effectively lowering marine maintenance costs.

The 500-ton vessels operate on exacting schedules in warm water. Many of the newer ships are built of steel, with light scantlings and with ¼-in. and sometimes 3/16-in. hull and deck plates. Much plate surface is inaccessible under insulation and protection against rust is urgently needed. Painted decks have been known to corrode through in 4 years.

Metallizing, first tried experimentally on most exposed areas, gave good results. It was progressively extended until today the whole envelop of a ship is sprayed with zinc before launching. Interiors of fish and bait tanks and welded joints in galvanized cooling coils are touched up at the same time. Reduced docking and maintenance costs have offset the initial expense in the first 2 years of operation.

Strong mechanical bond

Practically all of the spraying in San Diego has been done by Clark Metallizing, Inc., a member of the Metco System. Eighty-eight vessels, most of them tuna clippers, have been metallized in varying degrees since 1945. During a 3-year period this company metallized over ¼ million sq ft of steel surface on ship hulls, docks, chemical plants, and oil refineries.

The metallizing spray gun feeds a wire into a melting flame (oxy-acetylene usually). Molten metal is carried to the target surface by a jet of air at about 60 lb pressure. Control of feed, flame and jet are essential but not difficult. Metal is deposited in extremely fine particles and adheres to the surface with a strong mechanical bond.

Zinc or aluminum coatings sprayed on properly prepared iron or steel deteriorate very slowly. Life of the protection depends on thickness of the film. This can be varied by selection of wire diameter and the number of passes made during application.

Surface must be clean, dry

The surface must be clean, dry, and rough enough to insure maximum strength in the bond. Sand blasting is commonly used in the shipyards.

At times it is desired to metallize a surface which has absorbed undesirable elements from a gas or liquid. Appropriate cleaning techniques in addition to blasting are necessary. When the surface is ready, the spray must be applied as quickly as possible.

Zinc effectively protects iron and steel from the corrosive attack of sea water. A sprayed zinc coating is in every respect equal to one of the same thickness applied by the hot dip process.

Metallizing compared to galvanizing has many advantages. Metal can be applied to units or assemblies too large for dipping. A coating of any desired thickness may be obtained. Sprayed metal is of uniform purity whereas zinc baths

SPRAYING SPEED CONVERSION TABLE

Pounds per Hour — Feet per Minute

Wire	Size, in.	Ft per min									
		1	2	3	4	5	6	7	8	9	10
		Lb per hr									
Aluminum	3/16	1.91	3.81	5.71	7.61	9.52	11.42	13.32	15.23	17.14	19.05
	1/8	.85	1.69	2.54	3.38	4.23	5.08	5.92	6.77	7.61	8.46
Copper	3/16	6.40	12.80	19.20	25.60	32.00	38.40				
	1/8	2.84	5.69	8.53	11.38	14.22	17.08	19.91	22.75		
Tin	3/16	5.30	10.59	15.88	21.18	26.47	31.76	37.05	42.34	47.64	52.93
	1/8	2.35	4.70	7.06	9.41	11.76	14.11	16.46	18.82	21.17	23.52
Zinc	3/16	5.08	10.16	15.23	20.31	25.38	30.46	35.54	40.61	45.69	50.76
	1/8	2.26	4.51	6.77	9.02	11.28	13.54	15.79	18.05	20.30	22.56

Courtesy Metallizing Engineering Co., Inc.

Corrosion protection (continued)

become contaminated. It may be applied to some alloys which cannot be galvanized. Metallizing does not cause distortion, because it does not heat the base metal as much as galvanizing. It does not produce in welds the tendency to crack which the Bureau of Ships has found in some galvanized jobs.

Applied to assembled structures, metallizing protects fastenings. It is also commonly used to restore protection lost by welds made on galvanized material, especially piping.

Metallizing for protection of ship's stern plates from intense electrolytic action has advantages over fitting of sacrificial plates. As these plates waste away they become very rough and set up turbulence in the water which to some extent defeats their purpose. Fastenings for the plates also occasionally give trouble. The same weight of zinc applied by spraying protects a much larger area and presents a streamlined surface at all times.

Coat can be varied

In some cases metallizing offers advantages over paint. On iron and steel surfaces the base metal often becomes damaged beneath the paint before it is convenient to repaint. Then the first cost of spraying is justified.

The cost of frequent cleaning and painting plus the replacement and repair sometimes required when the surfaces are not so protected is much greater. By varying the thickness of a sprayed coat, its life can be controlled to suit special conditions. Where there is unusual difficulty of preparation or application, as on quay and pier supports, metallizing is far more economical than paint.

Frequently the sprayed coat alone furnishes all the protection needed. More often, however, it is used as a permanent priming coat over which paint or other materialss are used. Secondary coats are used as a sealer and for improved appearance or non-toxic properties. Life of paint is prolonged by the underlying sprayed coat, and cleaning is simplified and cheapened.

Sprayed aluminum and zinc offer excellent protection as bare metals without being painted. The same life may be obtained from thinner coatings of sprayed metals, however, by sealing or painting with specially developed anti-corrosive vinyl sealers. These close the pores of the metal surface, confine corrosion to the surface only and greatly reduce the exposed areas.

The complete treatment for protection against corrosion in salt atmospheres or where salt water spray is present follows: 1, blast clean; 2, metallize with pure zinc 0.006 in. thick; 3, apply one coat of seal primer; 4, apply two coats of anti-corrosive vinyl seal; 5, apply two coats of vinyl-alkyd color seal.

Metallizing has been used for many large construction projects. Most extensive to date is the

SPRAYING of pure zinc on bulwarks of seagoing steel tuna boat provides high corrosion resistance, cuts maintenance.

new works of the Abbey Steel Co. in Wales. It involves metallizing, during erection of steel structures having over 3 million sq ft of surface. The Panama Canal gates and the wind tunnels at Moffat Field have been metallized with excellent results.

The Signal Oil and Gas Co. has a steel approach pier to oil wells off the California coast. Exposure of supporting structure to salt water and tide action is severe. Two years ago part of this structure was metallized with zinc. The coating stood up so well plans are being made to cover the balance of the structure.

Iron and steel structures ashore may be subject to attack by industrial gases high in acid content. Zinc is not suitable but pure aluminum may be applied with good results.

Aluminum is used in a special process for protecting iron and steel from high temperature oxidation. It consists of heat treating a sprayed coating in the presence of a suitable flux to obtain heat resistant alloys.

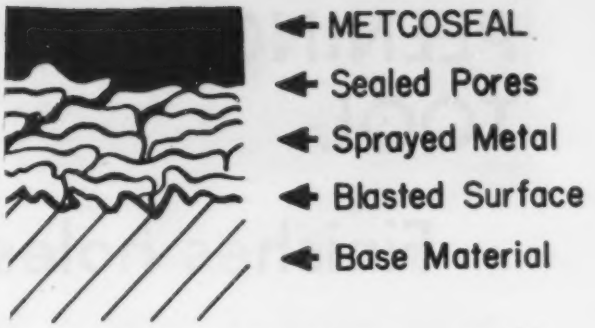
Effective at high temperatures

First used in Germany and England it is now gaining acceptance in this country. It is effective on exhaust piping, stacks and furnace castings where temperatures approach 1200°F. Some success has rewarded efforts to extend this application, by the use of chrome nickel alloys, to guard against temperatures up to 2000°F. Life of heat treating pots, annealing covers, and similar containers, fabricated of mild steel or cast iron, has been increased as much as 800 pct.

Usefulness of aluminum under varied conditions was strikingly demonstrated during World War II. Gas cylinders of English barrage balloons were sprayed with aluminum by Metallization Ltd. of Dudley, England. Six years later, after exposure to all kinds of corrosive attack ashore and afloat, they were examined and found to have perfect protection.

One of the earliest marine applications was made by Oliver Transportation Co. on 12 steel coal barges which operate in the corrosive waters of the Delaware River. It was necessary to dock the barges twice a year for inspection and painting, replacement of loose rivets, and renewal of badly pitted plates. They were metallized with zinc in 1932. Since then it has been unnecessary to replace plates or rivets. Barges are docked once a year for cleaning and painting. Abraded spots in the zinc coatings have been touched up occasionally.

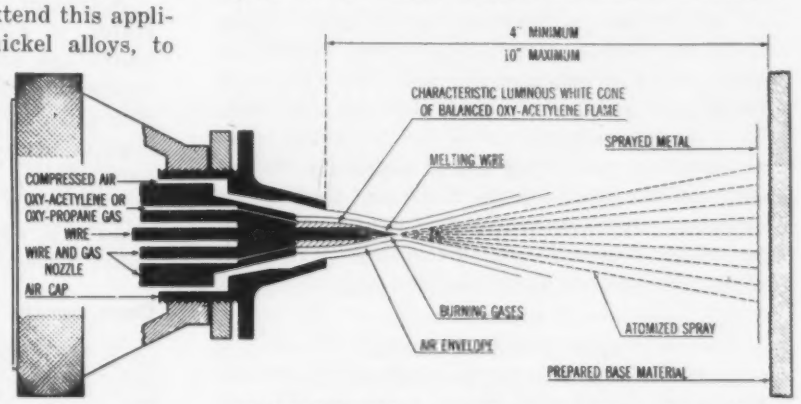
The growth of metallizing is similar to welding. Both were retarded by failures which resulted from unwise promotion in advance of the development of reliable tools, technique and tests. For many years the Lighthouse Service rejected welding because its first welded buoy broke at the weld, became a total loss, and left its post unguarded.



SEALER applied over sprayed metal closes pores of coating, excludes dirt, limits oxidation to surface.

Defense needs forced acceptance of welding and gave impetus to the development of metallizing. Members of the Metco System have developed their information and advanced standard specifications for coatings of sprayed metal or of its combination with various overcoats of vinyl or other paints which may be applied to a wide range of corrosion problems.

As the value of metallizing in marine industries becomes assured it may ultimately be applied to the most difficult of marine corrosion problems—cargo tanks of oil tankers. Steel ships carrying gasoline, acetone, and other "white" products in bulk corrode at a rapid rate. The rate is accelerated in those tanks which are at times carried empty or filled with salt water ballast. Total wastage of the tank structure is related to the number of cargoes carried. It is not uncommon in fast coastal ships to make extensive renewal after 6 or 7 years of service because scantlings have been reduced below tolerances set by insurance agencies.



CROSS-SECTION of metallizing gun shows relationship of wire, flame, compressed air stream, and target.

The American Petroleum Institute has had a special tanker corrosion committee for many years. The committee has been a clearing house for reports of Institute members who have tested every reasonable proposal for protection. At least one major company is interested in full scale tests of metallizing.

PEENING TOOL

Finishes holes fast, accurately

by George Elwers
Machinery Editor

Faster than grinding or honing, Bearingizing gives accurate size and fine finish to holes, shoulders, and shaft surfaces. Special tools peen work surface with thousands of minute blows from small steel rolls. Process does not remove metal, so cannot correct inaccurate holes. But it makes a good hole better in only a few seconds.

Increasingly stringent hole size and finish requirements in all types of civilian and military designs are focusing increased attention on the process of Bearingizing. This is a rapid accurate method of finishing holes, applicable when accurate size and/or a very fine microinch finish are required. Though Bearingizing tools have been available for about 15 years, new applications are being found regularly. In recent months particularly important new applications have been found in finishing holes in automatic transmission diecastings and precision hydraulic parts for firecontrol equipment.

The Bearingizing process consists of using a special tool for peening the hole surface with thousands of minute blows from small steel rollers. It increases the hole size a precisely predetermined amount, usually about 0.0005 to 0.001 in., and gives a finish as good as 5 microinches. Typical applications include holes in piston pins, bearings for auto oil pump bodies, universal joint yokes, and Oilite bearings. The process is particularly valuable for use with porous bearings of the Oilite type, because it does not close the pores through which lubricating oil is supplied. Bearingizing can also be used on external surfaces, such as bearing surfaces on electric motor shafts.

A typical internal Bearingizing tool is illustrated in Fig. 1. It consists of an arbor on which are fitted a roll cage which is free to rotate, and several bushings which serve as pilots. On the arbor, at the point where the roll cage is located, is the cam surface which imparts motion to the rolls. The cage is designed to hold rolls with their axes parallel to the arbor axis while allowing them freedom for the radial movement caused by the cam.

Cam causes peening action

In operation, the tool is advanced into the hole and rotated at high speed. As the arbor rotates, the cam surface turning under the rolls causes them to move in and out radially. Each time each roll moves out, it strikes a blow against the internal hole surface. As this happens, the cam surface moving under the roll rolls it a little against the surface of the work. Since the roll is confined in a cage free to rotate, this action during each blow causes the cage to rotate slowly about the arbor, insuring that each blow of each roll is struck in a different place than the previous blow. The total of all the thousands of

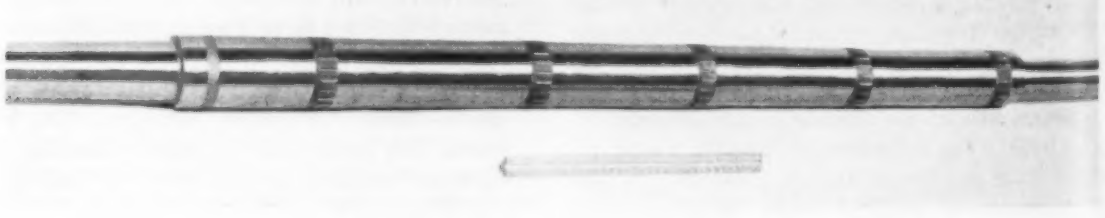


FIG. 1—This Bearingizing tool has five roll cages for finishing the inside surfaces of five holes on the same axis. It may be used to finish the crankshaft bearings on a new 8-cylinder automotive engine.

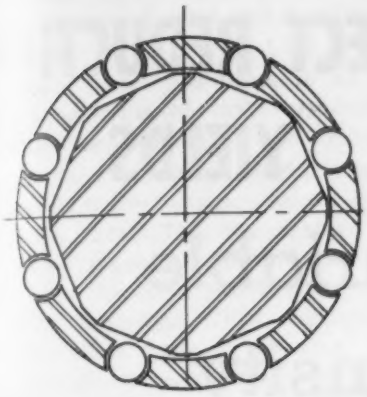


FIG. 2—Cross-section through the tool shown in Fig. 1, at one of the roll cages. Rolls are free for limited radial motion in the roll cage. This motion is caused by the cam surface machined on the arbor.

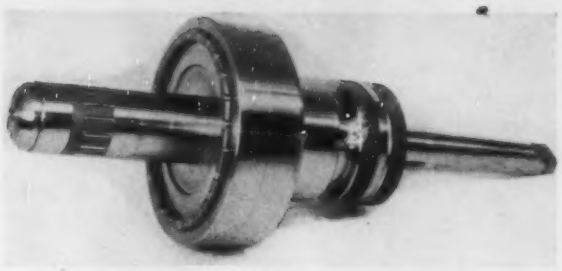


FIG. 3—A combination Bearingizing tool. Small diameter is a standard feed-in tool. Large diameter roll cage is expanding type. It expands after entering hole, to bring rolls in contact with hole surface. Used for shallow hole. EXPANDING types are also made for short, blind, and shouldered holes. Figs. 3 and 4 show typical tools.

blows struck as the tool rotates inside the hole is a peening action over the entire hole surface.

Arbors are made of non-deforming die steel. The usual cam is made by grinding precisely-indexed longitudinal flats on the cylindrical ground arbor surface. The narrow strips of the original arbor diameter which remain between the flats are the cam surfaces. This type of cam shows clearly in the Fig. 2, a cross-section through one roll cage of the tool shown in Fig. 1.

Rolls are made of high-speed tool steel. They resemble the needles of needle bearings, but are ground to more accurate size. The roll ends are slightly chamfered; otherwise, they are as perfectly accurate cylinders as it is possible to produce. Rolls for a given tool are matched to be the same size within 0.000025 in.

Holes precision-bored first

The usual method of machining holes to be finished by Bearingizing is precision boring, because it gives a round, straight hole, with no taper, bell-mouth, or other defects. Sometimes holes are prepared by reaming. In this case a free-cutting reamer is used with no attempt to get good finish. It is important that holes be accurately machined prior to Bearingizing. The process will make a good hole better, but it will not correct all hole inaccuracies.

Holes are machined from a few ten-thousandths to a few thousandths of an inch undersize, depending on the material, and the tool is designed to increase the size by the same amount. The tool must be made to a diameter greater than the size of the finished hole in order to do this. This oversize is called buildup. It is calculated to compensate for the workpiece material springs back toward its original shape, after a peening blow is struck, before taking a set.

Obviously each tool must be especially designed for a particular job. The amount the hole will be machined undersize, and the elasticity of the material, which determines the needed amount of buildup, set the tool size. Section thickness of the workpiece has an influence on buildup, as has the type of material. Previous machining also influences tool design since the finish it leaves influences the finish the Bearingizing process can produce. On a typical job Bearingizing reduced a surface finish of 50 microinches to one of 4 microinches.

Recommended arbor speed is a rotational speed sufficient to give the rolls a linear speed of about 400 sfpm. Tools have been made ranging from ¼ in. up to 12 in. in diam. Larger diameters can be made.

As the tool is used, of course, in time the rolls and arbor begin to show wear. When rolls have worn enough to produce holes undersize beyond limits, the tool may be restored by installing a new set of rolls. If arbor wear has occurred, the new rolls may be oversize to compensate. In production, holding a tolerance of 0.0002 in. on hole diameter, runs of 5000 to 25,000 pieces can usually be made before new rolls are needed. Usually two to five sets of rolls are worn out before the arbor needs replacing.

Cycle time only few seconds

The actual operation of Bearingizing a surface requires only a feed of a very few seconds in the hole. Thus the process is much faster than grinding or honing. It has the limitation, in comparison with these methods, that it removes no metal. Thus it cannot be used to correct bell-mouth, taper, out-of-roundness, or other defects in excess of the change in dimension produced. Tools are used in special machines built for the purpose, or in precision boring or drilling machines.

Tools may be built for straight holes, tapered holes, contours, or flat surfaces such as shoulders or hole bottoms. And they can be made for Bearingizing external surfaces so long as they are symmetrical about an axis of rotation.

FIG. 7—At left, knife blade forged to full density from 3.5 g per cc density and heated in blacksmith's forge. Top center, bracket of 1.15 density steel. Bottom center, slab of light density steel into which a wood screw has been driven with regular screwdriver. At right, light-weight hatchet with ⅜-in. reinforcing steel rod in handle. Blade forged to full density and hardened.

DIRECT REDUCTION YIELDS Variable Density Steels

Part II

By P. E. Cavanagh
Assistant director
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Toronto, Ont.

Pipe was made by rushing a mold through the kiln—and then dumping out unreduced ore in center. Hot-swaged bar (of mill scale) has same density and properties as steel of same analysis. One piece can have different chemistries, properties. Costs would be higher in steel producing area—probably lower at high-freight points.

The impact strength of low-density steel is limited. Therefore it is sometimes desirable to reinforce the material by placing rods of steel or other metals in the ore when it is molded into shape. The light-weight hatchet, Fig. 7, has a ⅜-in. steel bar in the center of the handle. The edge of this hatchet and the blade of the knife also shown were hot forged and have the required properties for such cutting edges. The bond between such reinforcing rods, bars or sheets and the controlled density steel is excellent. As the very low-density steel slab in Fig. 8 indicates, nails and screws can be driven with ordinary hand tools and the material can be worked with wood-working equipment.

A "sandwich" construction has been produced in which two thin sheets of stainless steel are placed ½ in. apart and the space filled with fine iron ore. One sheet is pierced with ⅛-in. holes placed about 1 in. apart to allow access of reducing gases. The light steel filler has a density between 1.0 and 1.5 per cc. The bond to the stainless sheets is satisfactory.

One of the annoying characteristics of any direct reduction process is that reduction takes place from the surface inward. It is quite common to find experimental sponge iron or controlled density steel parts which have not been reduced completely through. Sufficient time has not been allowed to complete reduction through the piece. This can be used to advantage in making hollow shapes. For example, Fig. 8 shows experimental pipes made by filling a cylindrical mold completely with fine iron ore.

This solid bar was reduced at such a fast cycle that only the outer skin was reduced to controlled density steel. Afterwards, the unreduced iron ore in the center was spilled out, leaving a hollow pipe. Under such circumstances the carbon content is always low. If a higher carbon content is desired it is possible to re-pass the part through the furnace a second time after removing the unreduced center. The density will then remain about the same but the carbon content will rise. Any unreduced material adhering to the pipe's inside surfaces is easily removed—hand reaming has been successfully employed.

Such pipes can be enameled inside. Their

weight is about ⅓ that of cast iron pipe. They can carry corrosive liquids and should cost less than cast iron.

Tests made under gas pressure as high as 2000 psi have indicated that very low-density steels (under 3.0) will leak to some extent.

This technique has proved useful in producing the hollow, light-steel saggers shown in Fig. 8. Coated with a suitable high-temperature, vitreous enamel, these saggers withstand the temperatures in both the controlled density steel and sponge iron processes. Heat conductivity is greater than those made of ceramics. The cost is far below high-temperature, alloy steel saggers.

Layer of ore seals saggers

A simple method of sealing the saggers has been found. Instead of ceramic or metal lids with clay seal, a loose layer of finely ground iron ore about 1-in. thick is placed on top of the charge. During the process, the bottom portion of this layer is reduced to metallic iron. During the cooling portion of the cycle, contraction of the gas inside the sagger pulls some air into it, no matter how good the seal. However, when an ore seal is used, the entering air is pulled through a layer of metallic iron. This layer is re-oxidized to iron ore. This provides satisfactory protection against oxidation of the light steel further down.

As stated previously, control of swelling and shrinking is accomplished by the choice of ore, control of grain size distribution, blending of ores with different swelling characteristics, reduction temperature and/or treatment time. It is possible to control shrinkage in "molded" parts to a remarkable degree. For example, Fig. 9 (at lower right) shows tensile test bars produced from shell molds with less than 1 pct shrinkage. Such control can be maintained from piece to piece within practical limits and makes possible production of such articles as those in Fig. 9 directly from shell molds.

Shell molding method preferred

The shell-molding technique is the preferred way of producing light steel parts to close tolerances. The surface finish is as good as a cast iron finish. It can be considerably improved by using fine sand for the mold and finer maximum screen size in the ore. Experiments are being carried out with resin-bonded test molds, replacing the sand with a reducing agent so that the mold performs a useful function in reduction.

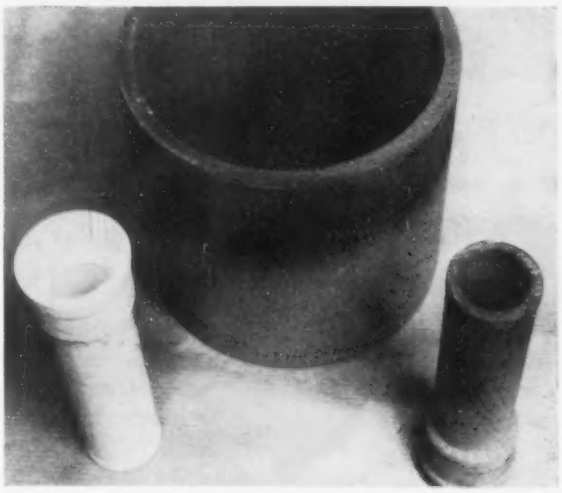
In the production of simple parts such as bars, tubes and angles, the extrusion technique* developed for iron ore can be used. No supporting molds are then needed. A binder such as starch will give sufficient green strength so that the extruded shape can be handled and packed in the sagger. The cereal type of binder provides some reducing action in the process. Other binders such as low-sulphur tar or thermo-setting resins can also be considered.

It appears possible to get slightly better mechanical properties in controlled density steel parts of the same analysis and density than in corresponding pressed powder parts. This is probably due to the fact that sintering takes place during and immediately following reduction. There is no chance for formation of any oxide films on the iron particles. The competition with iron powder would seem to be entirely where only a small amount of machining is necessary to provide the same tolerances achieved directly in pressed powder parts. The tolerances that can be expected from controlled density steel are somewhere between precision casting and ordinary casting. They do not approach the tolerances of pressed metal parts.

In order to replace a powdered metal part, the cost of finish machining on the controlled density part must be less than the savings accomplished by this new process' ability to eliminate some of the production steps and equipment common to powder metallurgy. As an example, where a simple shape of light steel can be produced as a blank for cold coining, there are possibilities of significant savings.

Because the voids in controlled density steel are not interconnected, it is possible to reheat and hot work the material without any unusual provisions to protect the surface against oxidation. For example, the forged knife blade and hatchet of Fig. 7 were heated in an ordinary blacksmith's forge and hand forged on an anvil. Bars and slabs of controlled density steel can be hot worked to the full density of normal steel. The new material cannot be hot worked in the same way as

FIG. 8—Light-weight steel saggers, enameled, are being used in the Ontario Research Foundation's pilot production of controlled density steel. Together with the pipe (shown enameled at left) which weighs 1/3 as much as cast iron, these hollow forms are made by giving a mold full of ore a fast pass through the kiln. The unreduced ore in center is dumped out and the inside diameter reamed by hand.



*Cavanagh, P. E., "Pelletizing of Iron-Bearing Fines By Extrusion", AIME Blast Furnace, Coke Oven and Raw Materials Conference Proceedings, Vol. 9, p. 54, 1950.

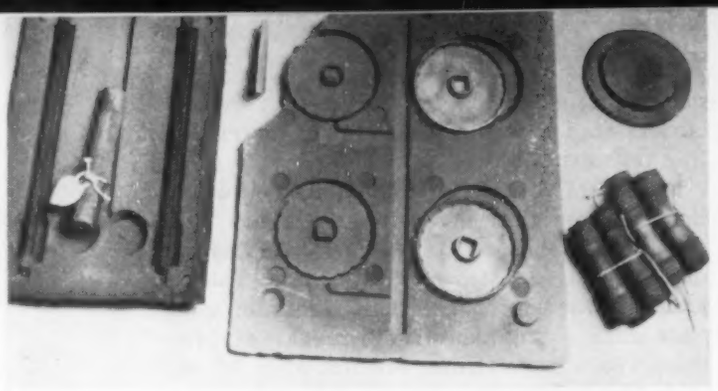


FIG. 9—Tube mold at left and ratchet gear mold in center were designed for liquid metal but were successfully used for the parts shown, made of ore. Oil seal at top right is ready for service immediately after drilling of bolt holes and painting. Tensile test bars at lower right were made in resin-bonded shell molds.

Variable density steels (continued)

ordinary steel. Any attempt to put it through standard rolling mill passes will simply smash the cellular structure. In the first stages of hot working the structure must be gently compressed.

The best method of working a round bar is by hot swaging at about 1900°F. The best method of rolling sheet is either in a closed pass mill or a mill equipped with following edge mills. The hot working of controlled density steel bears many similarities to the hot working of tungsten and molybdenum. There is one very important difference. It is possible to hot work controlled density steel above the welding temperature (about 2400°F) so that voids will be welded closed during the process.

Some of the voids will contain impurities or have surface conditions so that they will not weld. At some point in the hot working of the material these unwelded voids will work to the surface. The surface will then appear badly checked. However, the next pass, still above the welding temperature, will produce a good, hot-worked finish.

Fig. 10 shows the steps in production of cold drawn bar stock. If long bars are desired, the short bars produced by reducing iron ore in paper tubes packed in saggers, may be joined. They are then welded together at the working temperature of about 2350°F in a swaging machine. Bars hot worked from 1.050 to .395 in. diam can attain the full density of normal steel. They will stand a 180° cold bend test without any sign of cracking. After cold swaging down to 0.260 in. they have the same mechanical properties as a cold drawn bar of ordinary steel of the same analysis. (Fig. 11 and Table VI.)

To obtain competitive costs for plain carbon steel bars it is obviously impractical to carry on this process in the batch-type, tunnel kiln operation. Approaches to the continuous production of steel bar stock are illustrated in Fig. 12.

Some of the unique possibilities of controlled density steel will be apparent when it is realized that alloy additions can be made, for example, only to the surfaces of sheet slabs. Controlled rolling of such slabs may well provide a satisfactory full-density surface while leaving the interior at low density. Decorative stainless sheet may be possible with satisfactorily corrosion-

FIG. 10—Steps in production of normal density bar stock: from bottom, —60 mesh mill scale, paper tube filled with mill scale, reduced steel bars (density 4.3; carbon, 0.45 pct), bar with male and female joints cut, joined length of bar (1.050-in. diam), bars hot swaged at 2400°F to 0375-in. diam (note cold bends), bars cold worked from 0.375 to 0.260-in. diam.

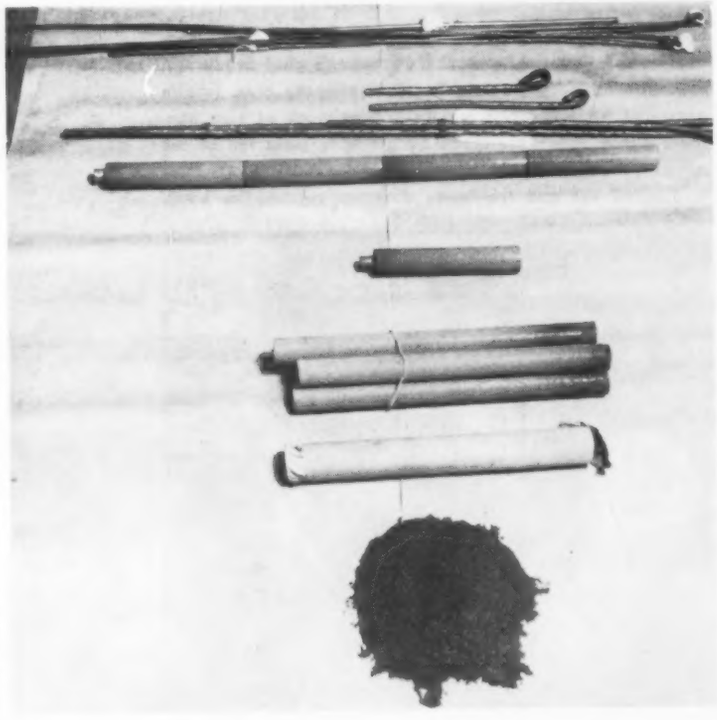


TABLE VI

PROPERTIES AFTER WORKING TO FULL DENSITY

Carbon content, pct	Working History	Hot swaging temperature	Yield point, psi	Ultimate tensile, psi	Elongation, pct	Redijn area, pct
0.38	Hot swaged 1.050 to 0.375 in.	1850°F	36,400	51,800	22.5	32
0.85	Hot swaged 1.050 to 0.375 in.	1850°F	68,600	98,200	1.0	4
0.38	Hot swaged 1.050 to 0.375 in.	2400°F	38,000	53,500	15.0	44
0.68	Hot swaged 1.050 to 0.375 in.	2400°F	51,000	86,000	12.0	22
0.38	Hot swaged 1.050 to 0.260 in.	1850°F	37,900	52,500	5.0	52
0.38		2400°F	38,700	62,100	10.0	8
0.38	Cold swaged 0.375 to 0.260 in.	.....	.....	103,000	.....	30
0.95	Hot swaged 1½ in. to ¾ in. cold rolled to ½ in.	1950°F	.....	141,800	.....	5
0.86	Hot swaged 1½ in. to ¾ in., cold rolled to ½ in.	1950°F	.....	123,400	.....	9

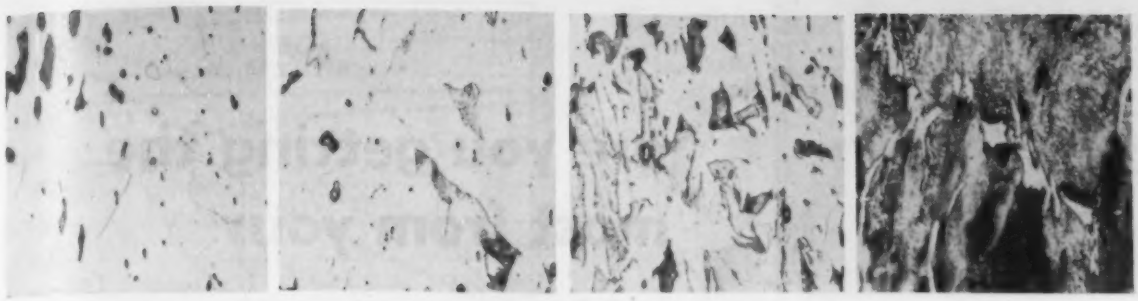
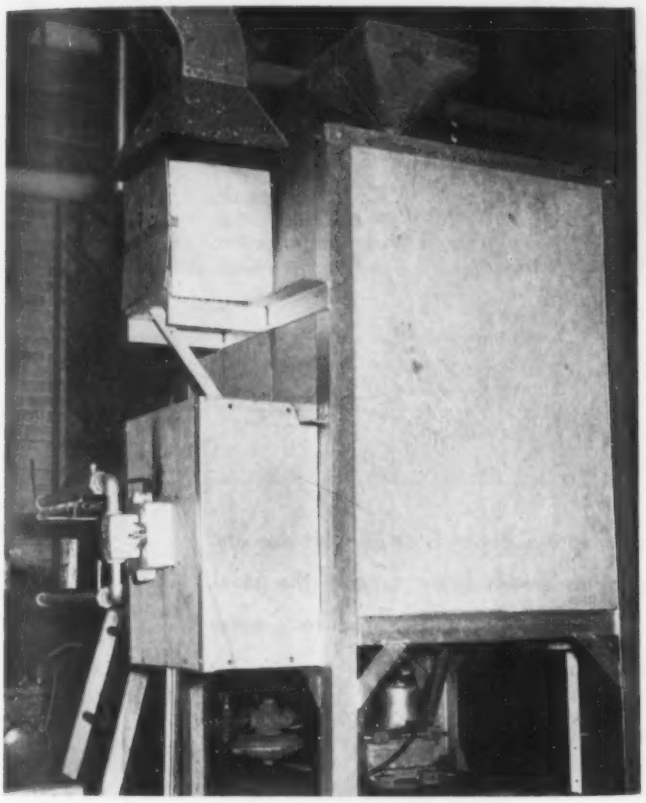


FIG. 11—All these microstructures of controlled density steel were hot swaged at 2350°F from 1.050 to 0.375-in. diam. Three samples at the right were then cold swaged from 0.375 to 0.260-in. diam. 375X.



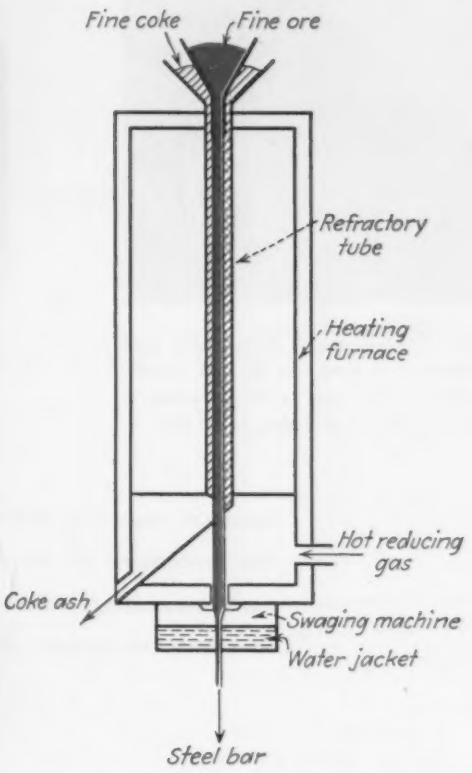


FIG. 12—At left (photo), experimental vertical tube reduction furnace. Ore is fed into externally heated tube. Metal passes through cooling jacket into gas-tight discharge chamber. At right (drawing), proposed furnace for continuous reduction and swaging of steel bar stock, which would be produced ready for normal working.

resistant surfaces only one-quarter to one-half as heavy as ordinary sheet. These possibilities are being studied.

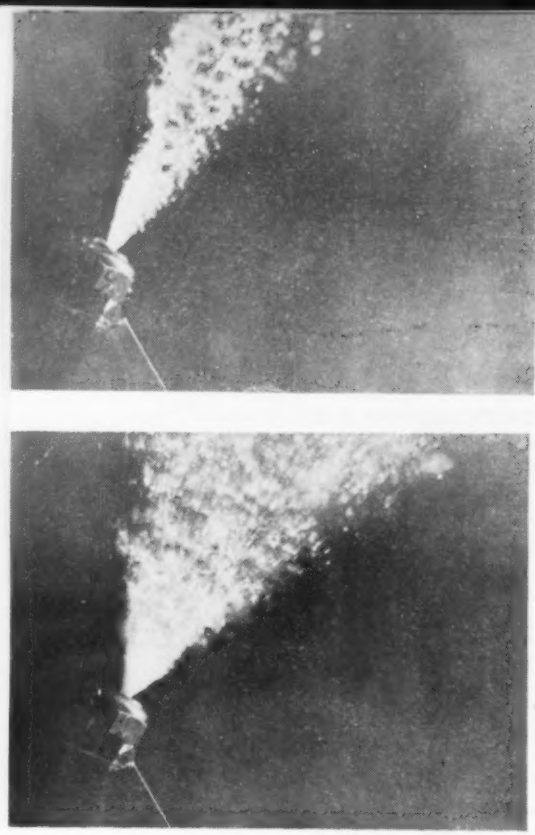
At present, it appears that producing normal steel by this method would be more expensive than purchasing it in a steel producing district. In many remote locations, however, the difference in production cost may be more than offset by freight rates.

The problem in continuous production of normal steel from controlled density steel at a reasonable cost is very largely a matter of furnace design. If an extremely efficient furnace can be designed to handle large tonnages rapidly, it may be possible in future to revise present estimates of the production costs of such steel.

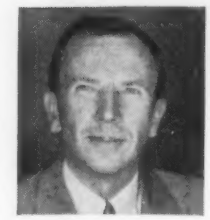
At present, with existing furnaces, this method for hot working controlled density steel to produce normal steel should be particularly applicable to production of some alloy steels, to production in remote locations and to provide a completely controlled source of small tonnages of steel.

In one respect the fact that "controlled density steel" is steel, and is called steel, is an obstacle to realization of its possibilities. The natural inclination is to compare light steel strengths unfavorably with ordinary steel strengths. If, instead, it were announced that: 1) a whole new family of metals had been discovered that ranged all the way from lighter than magnesium to the weight of steel; 2) that these metals were all readily available in huge quantities from operating mines; 3) and that some of the lighter metals were even cheaper

Turn to page 114



are you getting the most from your WATER SPRAYS?



By
W. P. Wallace
University of California
Los Angeles
and
C. E. Manes Jr.
Design Engineer,
Wintroath Pumps Inc.
Alhambra, Calif.

FIG. 1—High speed photographs show difference in drop size for two specific pressures. The top nozzle is working at 30 psig, the lower nozzle at 90 psig.

Speed of quenching with water sprays depends on droplet size and the breakdown of the insulating steam layer around the steel. Variables studied indicate water sprays can be used to greater advantage to promote deeper hardening.

Water sprays are widely used to cool metals but practically no quantitative information on the subject has been published. In practice the metallurgist has always relied on flooding a heated object with high presure sprays knowing that this method produced the fastest cooling rates obtainable. Because the heat transfer rates of still water and sprayed water vary widely this initial investigation was conducted to determine the precise effects of some of the variables.

The spray chamber utilized in this investigation contained six spray nozzles with 0.1094 in. orifices and 50° spray angles. Fig. 1 shows the nozzles being used at 30 psi and 90 psi pressures. The nozzles were arranged in a circular pattern in a horizontal plane. A positive displacement pump supplied water to the nozzles at various pressures and the flowrate as a function of pressure is illustrated in Fig. 2.

The specimens used were 1 in. diam. by 3 in. long of SAE-1020 steel, and the temperature at the center was recorded automatically by a self-

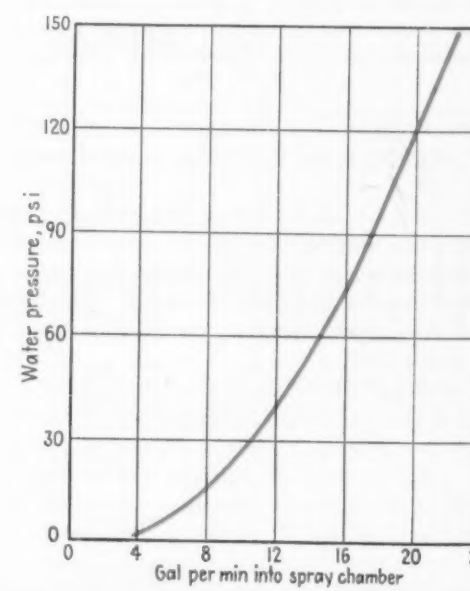


FIG. 2—Water pressure v. flowrate through nozzle.

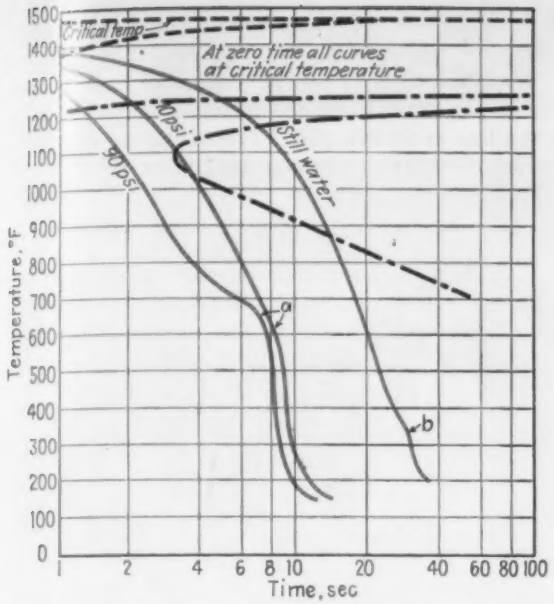


FIG. 3—Three continuous cooling rates plotted on the "S" curve. Cooling rates for the continuous curves were taken from the center of the specimen.

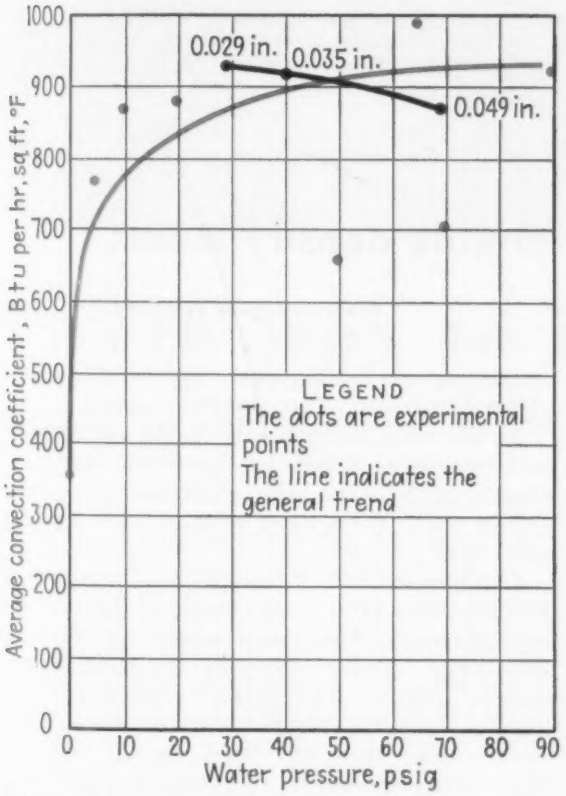


FIG. 4—Convection coefficient versus pressure.

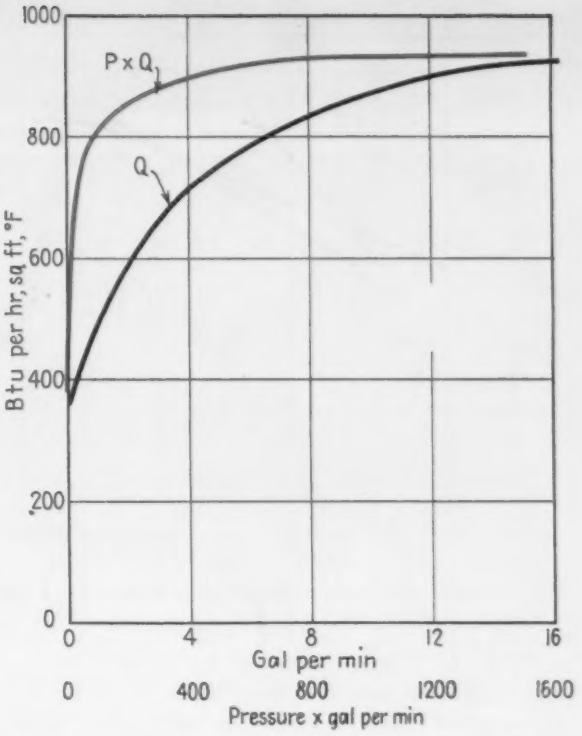


FIG. 5—Convection coefficient versus flowrate. Flowrate in this case is pressure times flowrate.

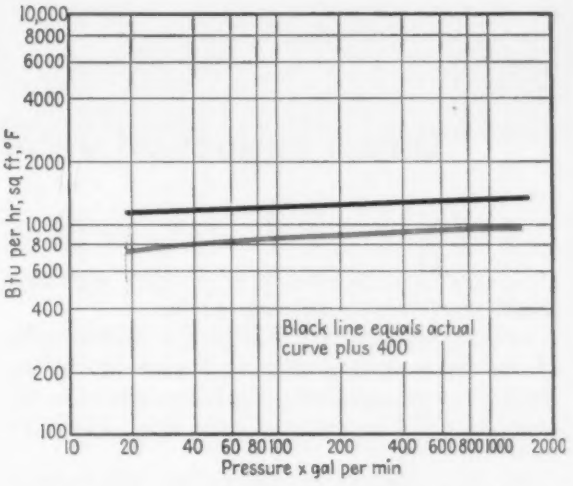


FIG. 6—Same as Fig. 5 except on a log-log scale.

balancing potentiometer. The size of water drops, measured by an optical comparator, was determined from high sped photographs.

Fig. 3 illustrates the cooling curves obtained for still water, and for sprays at 10 psi and 90 psi pressures; these cooling curves have been superposed on an "S" or a "TTT" curve for SAE-1020 steel. The time necessary to reach 1100°F by cooling in still water is approximately 9 sec and by spray quenching at 90 psi pressure, it is only 2 sec. By spray quenching it is feasible to increase the depth of hardening of carbon and low alloy steels. It will be observed that the cooling curves show changes in slope, such as points a and b. At present, a satisfactory explanation for these points cannot be given.

Of more interest, are the results plotted in Fig. 4, which illustrate the changes in the convection coefficient as functions of water pressure and drop size. The latter is shown as a dashed curve and the drop diameter is recorded by each point on the curve. The experimental points show considerable variation so that the curves may be too optimistic. This is still under investigation.

Fig. 5 illustrates the variation of the convec-

Quenching speeds of water sprays (continued)

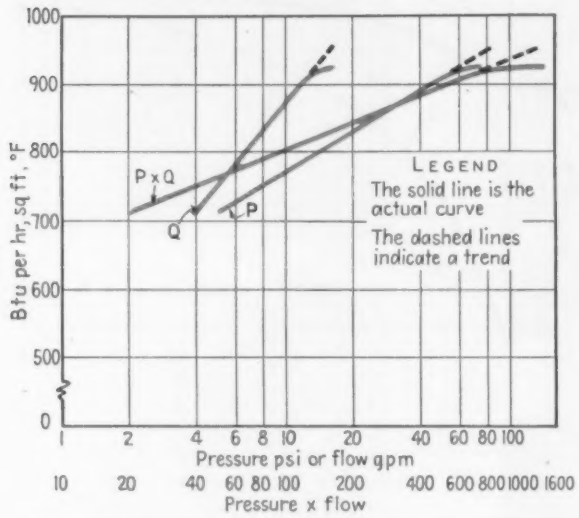


FIG. 7—Same comparison as Fig. 5 and Fig. 6 except that a semi-log scale is used.

tion coefficient as a function of the flow rate and the product of the flow-rate and pressure. Fig. 6 is a similar representation on a log-log scale and shows that the convection coefficient may be expressed as $h_c = C(P \times Q)^n$, where C is a constant, P is the pressure, Q is the flow-rate and n is the slope of the straight line. The solid line is of the form $y = cx^n$ and the dashed line, $y + b = cx^n$. From the latter, n or the slope of the line is 0.0336, C= 1110 and b = 400. With these constants, the expression for h_c is as follows:

$$h_c = [1110\ (P \times Q)^{0.0336}] - 400$$

In Fig. 7, similar data plotted on semi-log paper. The lines are of the form $y = ce^{mx}$ and with proper evaluation of the constants from this graph, the expressions for h_c are as follows:

$$h_c = 57.9 \ln \frac{PQ}{9.45 \times 10^{-6}} \quad \text{(For P x Q)}$$

$$h_c = 174.5 \ln \frac{Q}{0.0684} \quad \text{(For Q)}$$

$$h_c = 88.1 \ln \frac{P}{0.00158} \quad \text{(For P)}$$

The authors are indebted to A. A. Cree, General Electric Co., Schenectady, for his help and assistance with the project and this article.

Direct reduction yields variable density steels

Continued from Page 111

than cast iron, consideration of these materials would start from a different angle.

In many applications cast iron is used in spite of its mechanical properties because it is the cheapest metal available. Cast iron soil pipe, for example, could be made of light steel, using the same patterns.

The Foundation's studies of the manufacture of sponge iron in tunnel kilns from magnetites and mill scales have established some cost figures. In Canada, such sponge iron costs between $40.00 and $50.00 a ton to produce, depending on local conditions, prices and equipment.

The extra costs above those in making sponge iron to produce light steel are in superconcentrating the ore and holding it longer in the furnace. Allowing a generous $20.00 per ton for these extras, the cost would be $60.00 minimum and $80.00 maximum per ton. This compares favorably with a figure of about $65.00 to $80.00 per ton (no overhead) for foundry iron in the ladle ready to pour into pipe molds.

Sand molding costs will be about the same for both processes, with some advantage to the light steel because less sand is used. No gates, risers or sprues are required for light steel. The saving in cleaning and cutting costs could pay for a coat of paint or possibly even porcelain enamel.

So the main difference is in the cost of the metal per pipe. But if the light steel pipe has a density of 2.7 (the same as aluminum), there will be nearly three times as many pipes for the same weight of metal.

The sponge iron investigations from which this discovery grew were carried on by the Ontario Research Foundation under the Ferrous Metallurgy Sub-Committee of the Ontario Research Council. The sponge iron work was financed by the Government of Ontario and by contributions from the Steel Co. of Canada, Atlas Steel, Dominion Foundries & Steel and Algoma Steel. The assistance and advice of these organizations has been invaluable in the controlled density steel investigation.

The help given in hot and cold working of controlled density steel by Cleveland Wire Works of General Electric, by Burlington Steel, Atlas Steels and the Steel Company of Canada made available production equipment and advice could not have been duplicated. In addition, many other companies and persons have helped make possible a very rapid advance in this new process.

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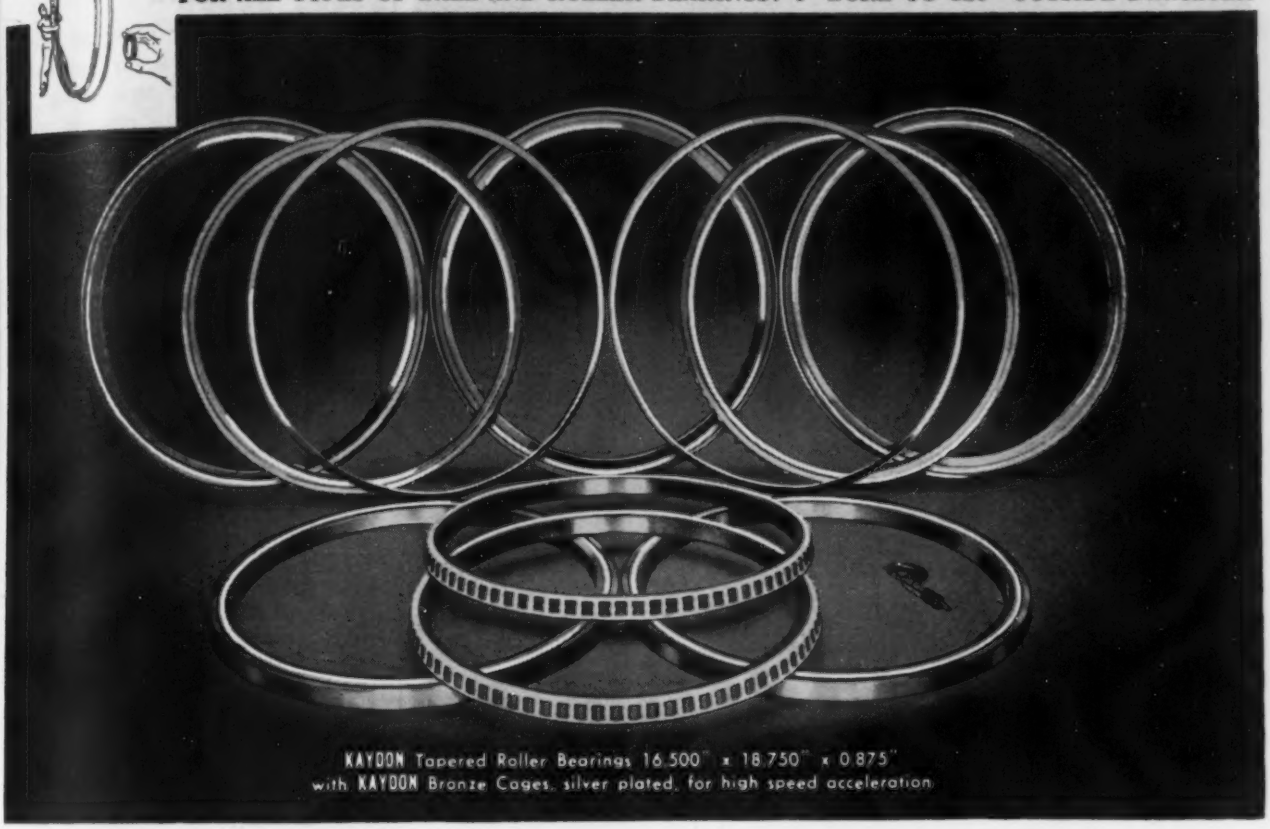

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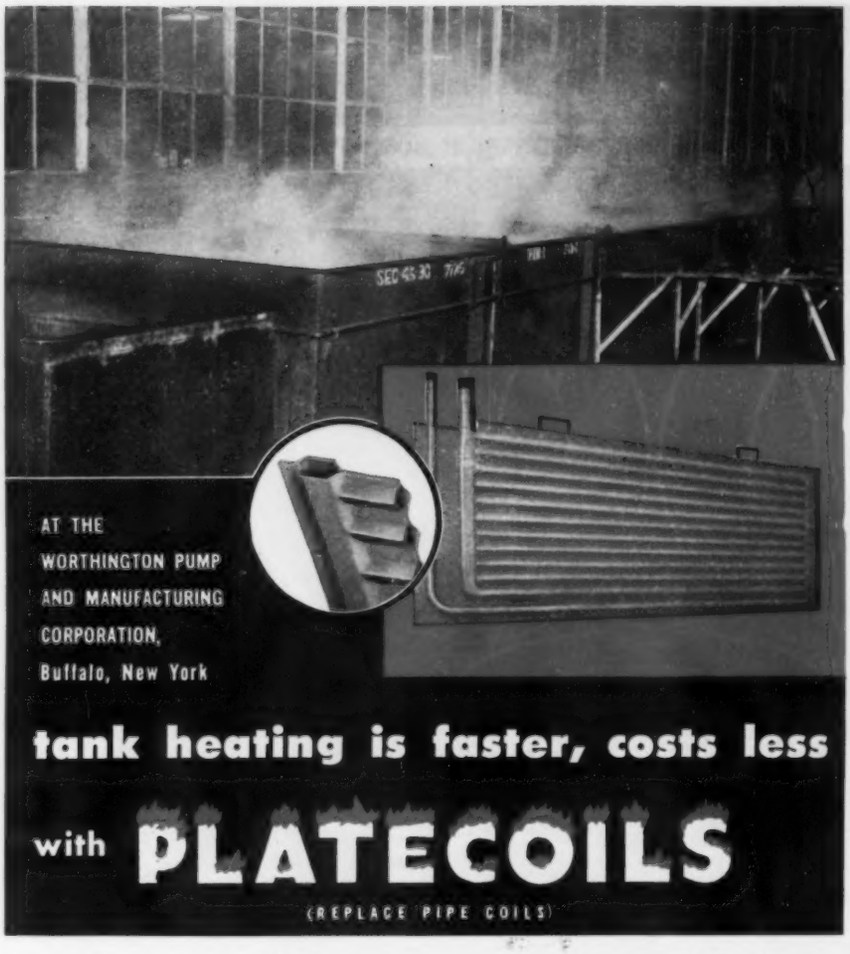
PRECISION BALL AND ROLLER BEARINGS



Worthington Pump and Manufacturing Corporation has found that it costs less to buy and use Platecoils in their Parkerizing tanks than it does to make their own steel pipe coils. When the steel pipe coils were used, they had to be replaced on the average of every 3 months. The Platecoils have been in use over a year, and there have been no repairs or expenses other than the original installation cost.

Platecoils heat the tanks faster because they have greater prime surface in any given area. A 22" x 47" Platecoil gives the same heat transfer surface as 32 ft. of 1½" pipe. This not only means quick starts in heating tank solutions but also greater tank capacity for work.

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By the use of "quick change hangers," Platecoil installations can be made in open tanks in a half hour or less by one man and a helper. There is no welding or pipe cutting . . . two connections to make and the installation is complete. Should repairs become necessary, Platecoils can be removed and replaced in a matter of minutes without emptying the tank. Replacement is made from outside the tank.

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—Free Literature—

Continued

Carbon brick

A revised catalog covering carbon and graphite brick for application in the chemical, processing and metallurgical industries is available. Complete tables for brick sizes, shapes, grades and physical properties are included. *National Carbon Co., Div. of Union Carbide & Carbon Corp.*

For free copy insert No. 14 on postcard, p. 121.

Grinding, polishing

Kalamazoo abrasive belt and wheel grinding, polishing and buffing machinery is described in a new bulletin. The abrasive wheel method offers faster, cooler cutting, less operator fatigue, safety in use, improved finish and increased production in many plants. *Hammond Machinery Builders, Inc.*

For free copy insert No. 15 on postcard, p. 121.

Power presses

Important design features of Clearing power presses are described in a new 16-p. booklet. Among these features are the Clearing pneumatic clutch and the swing key clutch. Frames are stress relieved and amply reinforced for maximum strength. *Clearing Machine Corp.*

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Truck chargers

Hobart automatic motor generator chargers for industrial trucks are described and illustrated in a new 6-p. folder. Principles and theory of operation of the charging sets are explained for charging all types of Edison and lead batteries used in motorized hand and driver-ride electric trucks. *Motor Generator Corp.*

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Hydraulic fluid

A new type hydraulic fluid developed for use in die-casting machines, hydroelectric turbines and hydraulic presses where a nonflammable type pressure transfer liquid is required, is described in a new booklet. Chief among the properties of Pydraul F-9 is its safety factor. *Monsanto Chemical Co.*

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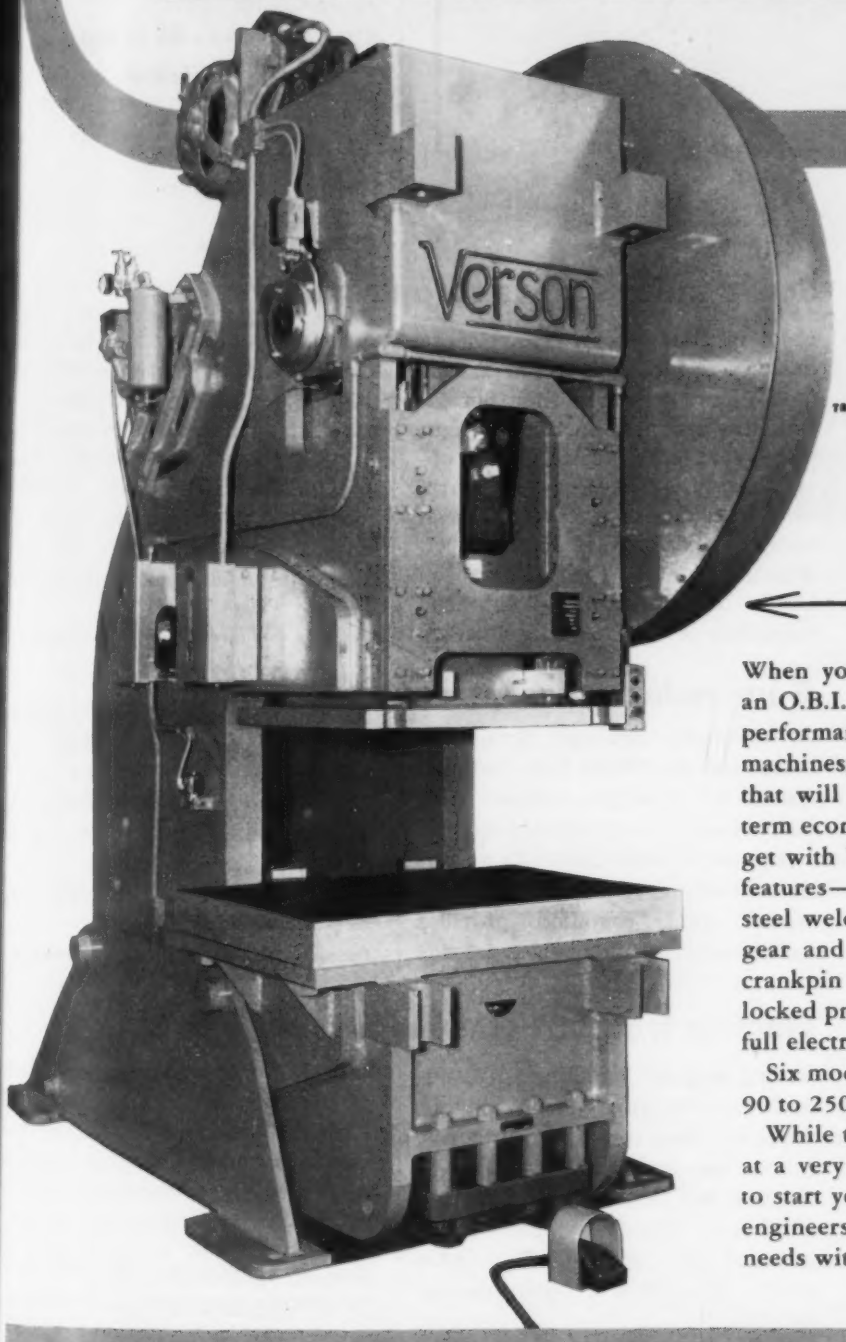
You get *BIG* Press Standards of Construction and Performance



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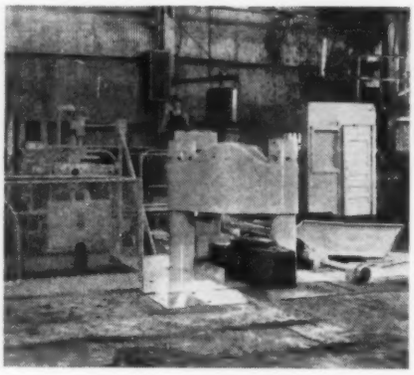
NEW equipment

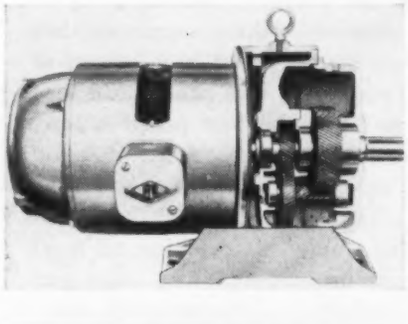
New and improved production ideas, equipment, services and methods described here offer production economies . . . fill in and mail postcard on page 121 or 122.



Scrap baler speeds scrap recovery

Bales of steel scrap that are more uniform in size and weight and of much greater density than heretofore are produced in a new, completely automatic scrap baler operating at the Wheeling Steel Corp. The installation compresses steel scrap to a density of 45 to 70 pct, depending on the type of scrap on hand. Loose scrap fed into the baler box is crushed and squeezed into approximately an 18-in. square block weighing between 600 and 1000 lb. Three hydraulically operated rams transform a tangled mass of trimmings into a compact, easy-to-handle block of scrap. A fourth ram opens and closes the baler box, pushes the bales out of the way. The equipment was built by *Hydraulic Press Mfg. Co.*

For more data insert No. 19 on postcard, p. 121.



Gear reducer has internal fluid coupling

A standard Reuland fluid-shaft motor and gear train have been designed into a single, compact unit. Its purpose is to convert the motor's conventional high-speed into a slow-speed, high torque output. The integral fluid coupling provides cushioned starting of heavy loads and protection against jamming of equipment. Motoreducers are available with squirrel cage, fluid-shaft or slip ring driving motor, polyphase or single phase. Output speeds range from 1 to 600 rpm. *Reuland Electric Co.*

For more data insert No. 20 on postcard, p. 121.

Electric tractor in the medium-duty class

Where material handling in manufacturing, storage and shipping areas requires versatile equipment, a new two-wheel drive tractor is rated at 400 lb normal and 2000 lb maximum drawbar pull. When powered by the specified 48-v source, it attains a light running speed of 7½ hp. A tiller-bar effectively controls the four-wheel steering system. Travel, on the standard arrangement, is manually controlled by a three-speed snap-action mechanical contractor unit. Foot acceleration is available where preferred. *Mercury Mfg. Co.*

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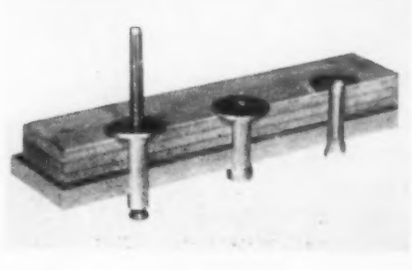

One-person installation for new blind rivets

A low silhouette, large diameter head, blind rivet provides an increased bearing area when fastening thin or soft materials to metal frameworks. The rivets are used for foil, plywood linings or floors, Masonite or Bristol Board panels, insulation, etc. Installation is by one person from one side of the work. Rivets are available in both aluminum and steel in either pull through or self plugging types, ⅛, 3/16 and ¼ in. diam. *Huck Mfg. Co.*

For more data insert No. 22 on postcard, p. 121.

Non-slip floor plate

Tradenamed AW Algrip, a new floor plate combines abrasive grain and rolled steel. It is designed for floors and walking areas where there is danger of slipping. Algrip is impregnated with aluminum oxide grain, the same abrasive material used in grinding wheels. It can be sheared, drilled, countersunk, machined and flame-cut. *Alan Wood Steel Co.*

For more data insert No. 23 on postcard, p. 121.

Bond for finishes

Phospray, a new cold spray bonding solution can be applied with ordinary spray equipment. It eliminates preparatory steps such as cleaning, rinsing, drying, etc. It dries immediately, ready for application of the final finish. It can be used on all metals except aluminum. *Du-Lite Chemical Corp.*

For more data insert No. 24 on postcard, p. 121.

Lapping compound

A boron carbide lapping compound is claimed to cut faster and resist breakdown better than any material used in lapping other than diamond. It will cut approximately 2/3 as fast as diamond, and can be used on all materials both metallic and non-metallic on which lapping is being done. The carrier for the abrasive is soluble in kerosene and other petroleum products and vegetable and animal oils; it is not water soluble. Compound is packaged in a handy collapsible metal tube. *Robert Marks Co.*

For more data insert No. 25 on postcard, p. 121.

Knock-down shop stool

Adjustable in three sizes to 15 positions and designed to be shipped and stored economically, a knock-down shop stool has a welded seat assembly, double-angle leg construction for strength and an automatic nut-locking feature. Adjustment can be made with four small bolts. *Standard Pressed Steel Co.*

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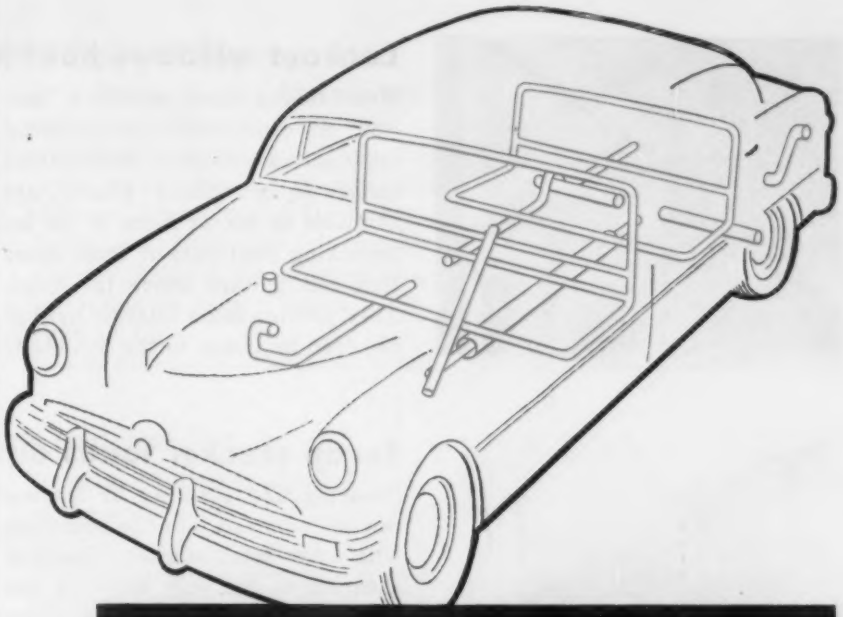
Turn Page

another job for Brainard ELECTRIC-WELDED TUBING



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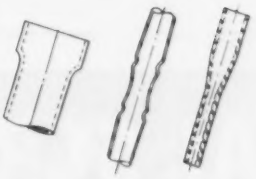

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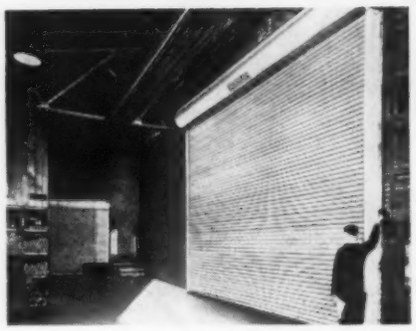
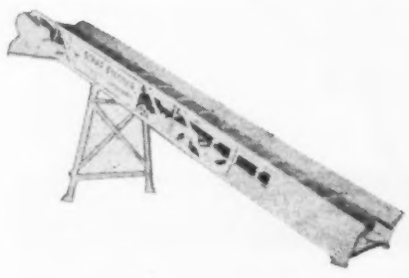


Lookout windows built into steel rolling doors

Metal rolling doors provide a "new look" for commercial and industrial applications. Narrow, transparent panes of heavy-duty plastic are available in one or more of the interlocking steel slats of these doors that coil upward above the lintel. They provide more interior light if required or vision to the outside if desirable. The rolling doors are constructed of openhearth steel interlocking slats, heavily galvanized, and equipped with endlocks that maintain alignment. The metal curtain travels in steel guides and coils upon a barrel journaled in heavy-duty brackets. *Kinnear Mfg. Co.*

For more data insert No. 27 on postcard, p. 121.



Scrap stacker loads directly from shear

Shearing and stacking or loading can be combined into one operation with a new scrap stacker. Speed of shearing is the only limit on the stacker's capacity. It is a slider belt conveyer of electrically welded construction; has a 30-in. wide wire mesh belt and 8-in. diam rubber covered steel pulleys. Neoprene belt and steel pulleys are optional equipment. Flights of 1½ in. are spaced 18 in. apart. Normal incline is 30°; adjustable supports permit various loading heights. Power is supplied by a 1-hp right angle geared head motor driving at the head end. Standard discharge chute is available. *Scrap Stacker Co.*

For more data insert No. 28 on postcard, p. 121.

RECLAIM VITAL SCRAP *with a* M

Conserve critical metals . . . increase self-sufficiency . . . eliminate scrap handling and storage problems with the press that pays for itself. The MILWAUKEE Briquetting Press automatically converts low-grade bulk borings, turnings, chips and shavings into dense cylindrical briquettes which can be charged directly into furnace or foundry cupolas as high-grade scrap.

Steel, aluminum, cast iron, bronze, magnesium, brass and other metals can be briquetted by a MIL-

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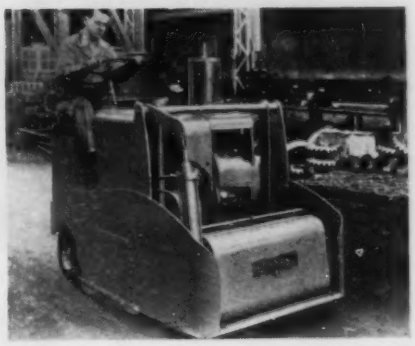
Machine cuts heavy grime off plant floors



In one operation a new 25 hp scarifying machine cuts loose and picks up hard, embedded layers of dirt, oil and metal cuttings from large trucking aisles. Its rapidly rotating — 1400 rpm — cylindrical wire brush or cutter-equipped Revo-tool cuts a 36-in. wide path through traffic-packed grime at speeds up to 11 mph. Cleaning capacity is 20,000 to 60,000 sq ft per hr. Loosened, pulverized soilage is hurled into a built-in dirt hopper. A powerful 11-in. vacuum fan pulls lighter dirt and dust into a heavy fabric bag. Trucking surfaces are left smooth and dry without use of chemicals, detergents or hand scraping. *G. H. Tennant Co.*

For more data insert No. 29 on postcard, p. 121.

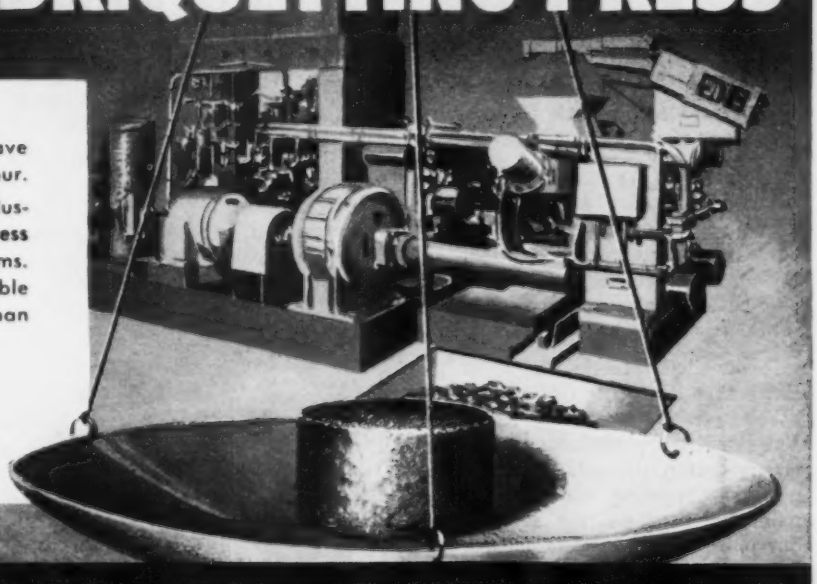
New gasoline engine driven arc welder

Control panel on a new gasoline engine driven arc welder is mounted on the end of the unit at the generator end, for centralization of controls and easier adjustment of the welding heat. Generator is symmetrical, four-pole multi-range design. Control of the 1000 combinations of welding current and open circuit voltage is by large wheel and volt-amp adjuster within the large wheel. Ten main steps or ranges are selected by a heavy copper switch, molded in bakelite, operated by large hand wheel. The welder is stationary or mounted on a pneumatic-tired four wheel trailer. *Hobart Bros. Co.*

For more data insert No. 30 on postcard, p. 121.

Turn Page

MILWAUKEE BRIQUETTING PRESS



WAUKEE press. Six models are available which have capacities ranging from ¾ to 3½ tons per hour. **Leading manufacturers** in the metal working industry are utilizing the **MILWAUKEE Briquetting Press** to solve their vital material and scrap problems. Savings effected by the MILWAUKEE Press enable most users to **write off the entire cost** in less than one year.

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Pre-Fos—another helpful Wyandotte Chemicals product at work*

New Wyandotte phosphating cleaner ups production 50%, saves dollars!

YOU'RE LOOKING at steel fishing rods that used to require four stages in their production cycle before painting. Now they take only three!

Thanks to a Wyandotte Sales Supervisor and PRE-FOS, a new Wyandotte Chemicals phosphating cleaner, one stage is eliminated. Production time is cut, valuable shop room is saved and better cleaning and paint preparation is obtained.

Read what Murrie Betts, of the Betts Manufacturing Company, says: "We're completely sold on Wyandotte PRE-FOS for phosphating steel. It cleans better, deposits a fine-grained phosphate coating which helps hold paint and prevents rust. It speeds up our phosphating 50%, is cheaper and lasts longer."

Investigate Pre-Fos

If you are painting or rust-proofing metals, investigate Wyandotte PRE-FOS.

Also look into the fine Wyandotte Chemicals line of products for burnishing and burring, vat, electro, steam-gun, and washing-machine cleaning, paint stripping, acid pickling, phosphating, related surface treatments and spray booth compounds. And ask about Wyandotte ZORBALL, all-purpose floor absorbent.

Write us for free technical help and direction on any of your cleaning problems. There is no charge or obligation for this helpful service. *Wyandotte Chemicals Corporation, Wyandotte, Michigan; also Los Angeles, California.*

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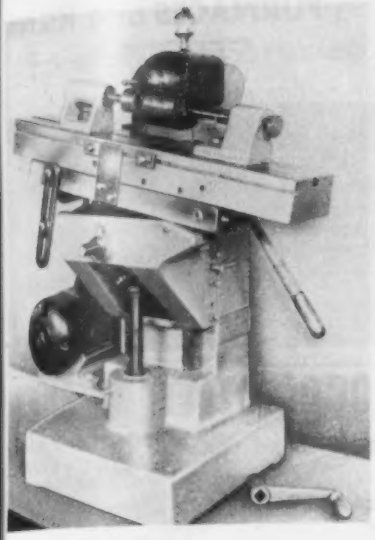
For more data insert No. 31 on postcard, p. 121.

Fast order picking

Quicker order picking by use of mechanical methods is made possible by a new lightweight tractor. It is able to tow 10-ton loads on a level floor. Controls are at the rear, enabling the driver to get on and off easily. An auxiliary forward movement control handle on each side permits the operator to walk the vehicle from the side. When riding the tractor, the operator stands on the rear platform and controls the movement by a conventional directional switch and foot control pedal. The battery-operated FTE measures only 29 in. at its broadest point. It turns in a trifle more than its 52-in. length. *Automatic Transportation Co.*

For more data insert No. 32 on postcard, p. 121.



Compact miller

The new commutator undercutting milling machine, ruggedly engineered for use with carbide tools, is designed for high speed production applications. Important features are: High speed Parker majestic spindle; heavy rugged cast iron frame; pre-loaded ball bearing table with tilt provisions for better visibility; hardened and ground elevating screw; ½ hp motor with V-belt drive; lube fittings throughout. *Gay-Lee Co.*

For more data insert No. 33 on postcard, p. 121.

Nickel-free electrode

A new nickel-free electrode for cast iron, EutecTrode 27, does not replace nickel-bearing electrodes on all applications. It offers an extremely high-tensile weld with a uniform amount of carbon in the deposit. The deposited material is similar to a high tensile, high carbon steel, and increases the tensile strength of the weld. *Eutectic Welding Alloys Corp.*

For more data insert No. 34 on postcard, p. 121.

Hand screw driver

Hy-Pro adapter hand drivers and holder take interchangeable bits; drive screws with Phillips recessed heads. Bits are available in four sizes, but No. 2 size insert bit will drive from 75 to 80 pct of all screws having Phillips recessed heads. *Continental Screw Co.*

For more data insert No. 35 on postcard, p. 121.

Turn Page

LOW-COST HANDLING *for the* BASIC METAL WORKING INDUSTRIES

The outstanding feature of Atlas power-operated cars is their ability to perform with utmost efficiency and economy in your operations. This is because each car produced by Atlas is engineered to the specific needs of the customer.

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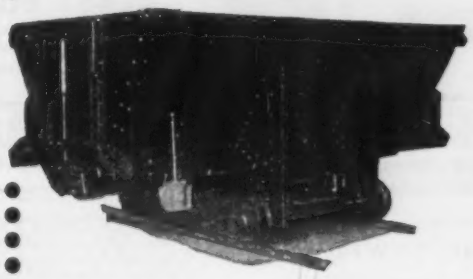
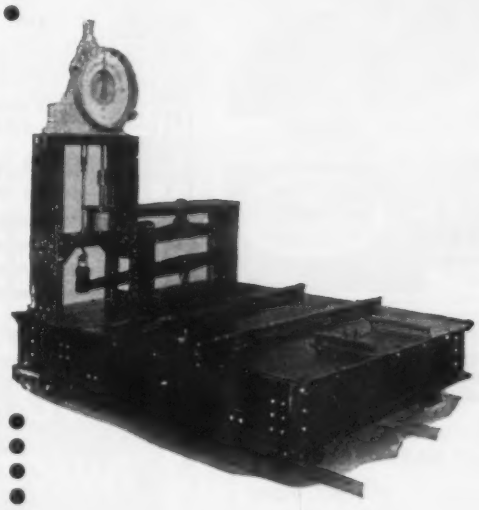


8 TON CENTER DUMP FURNACE CHARGING CAR

The discharge gates are arranged so that the charge may be spread to the best advantage over the width of the furnace. Gates are hydraulically operated through a hand pump. Car is mounted on anti-friction roller bearings with spring-mounted journals and is provided with automatic engine couplers.



CUPOLA CHARGING SCALE CAR

Car has ball bearing steel turntable on top of the car upon which charging buggies are placed and weighed. Car has anti-friction bearings at main journals.

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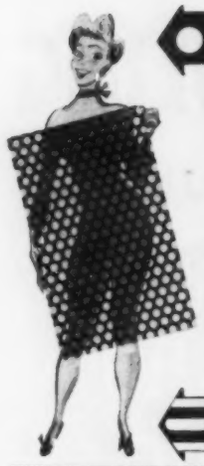

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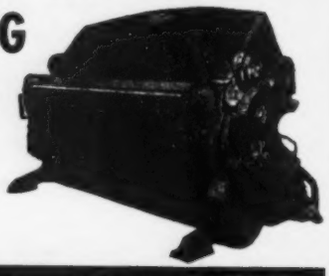
CHICAGO **BENDING BRAKES**



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Improved tong brazing

The power supply for incandescent-carbon, tong brazing has been substantially improved. A larger water reservoir is provided and a pump with more positive pressure insures more effective water cooling. Piping is arranged so that water need not be drained when changing tongs. Although both sizes have been increased in capacity—25 and 50 kva, instead of 20 and 40—a more rigorous duty cycle safely can be accommodated. *Westinghouse Electric Corp.*

For more data insert No. 36 on postcard, p. 121.

Anti-rust preparation

Stop-Rust, a new and improved rust preventative, absorbs and evaporates moisture from the pores of metal. It does not seal in moisture which can form rust or corrosion pockets under the protective film. Stop-Rust absorbs such entrapped moisture, floats it out to the surface and evaporates it. The product is applied at room temperature by brush, dip, spray or wiping on. It is clean, easy to handle, not messy or slick, not harmful to the skin. *Stop-Rust Co.*

For more data insert No. 37 on postcard, p. 121.

Machine pins

Spirol pins engineered to overcome the inherent shortcomings of fastening pins are formed by rolling strip steel spirally. The pin is a coiled spring, physical properties of which can be changed by varying thickness of the strip, the tightness of the coils and the number of coils in the spiral. They will not creep out, because the resistance of the coils of the spiral to displacement causes the pin to assume the shape of the hole throughout its length, and securely locks the pin in position with a uniform distribution of stresses. Spirol pins expand to their normal size upon removal. Pins are available in three standards: heavy, medium, and light duty. *C.E.M. Co.*

For more data insert No. 38 on postcard, p. 121.

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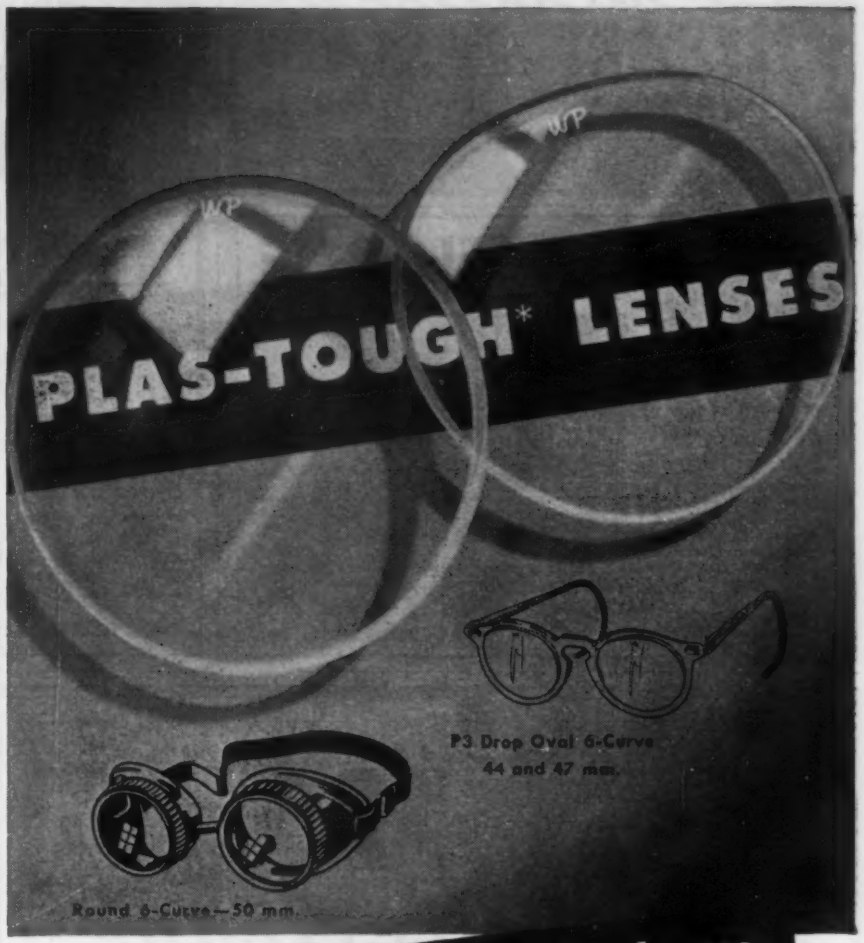
New WILLSON®



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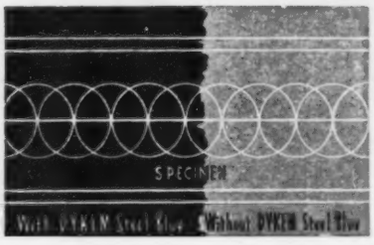

Simply brush on right at the bench; ready for the layout in a few minutes. The dark blue background makes the scribed layout lines show up in sharp relief, and at the same time prevents metal glare. Increases efficiency and accuracy.

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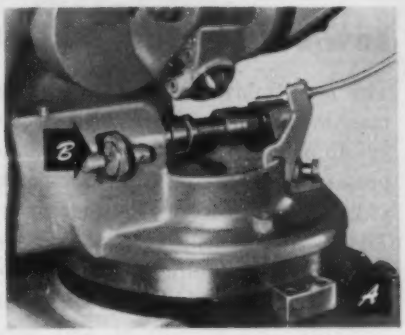

Improved hobber

Two recent improvements in the Hamilton No. 1 gear hobber that is used for the generation of small precision gears is a vernier (A) to measure minutes of the degrees on the turntable scale. The added ease with which accuracy is attained at this point is said to substantially reduce setup time thus reducing costs. The second improvement, shown at B, is a knurled thumb wheel that provides an accurate and rapid means of positioning the hob relative to the workpiece. This device speeds setup, extends periods between hob sharpenings. Ruthman gusher pumps are used for circulation of coolant. Coolant system is operated through controls independent from other working parts. *Hamilton Tool Co.*

For more data insert No. 39 on postcard, p. 121.

Gouging, cutting torch

The new torch operates on an ordinary dc welding machine and a compressed air line. It removes defects in castings or forgings, cleans root of welds, removes welds; and grooves, cuts, bevels metals. Not much larger than an arc-welding electrode holder, it contains an air control valve and rotating nozzle which permit changing the electrode angle to suit the job, but maintain the air jet in perfect alignment. Resulting surface is clean and smooth and welding or brazing can be done without further grinding or cleaning. *Arcair Co.*

For more data insert No. 40 on postcard, p. 121.

Turn Page

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Scientific schools and groups of designers, engineers, metallurgists and technical societies can *now* secure the *free* use of this full-color sound film, the first produced in the steel foundry industry. Available in 16 mm prints, the film is a 37-minute tour of the modern plant of Lebanon Steel Foundry. The camera follows jobs from the blueprints on the project engineer's desk through steps of production to show, finally, a few of the many important uses of Lebanon quality Steel Castings. Write for information on this exciting and educational film.

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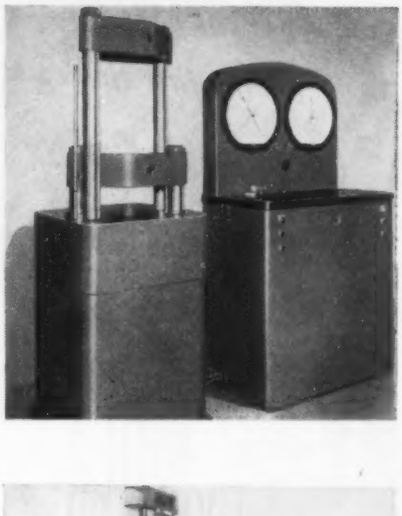
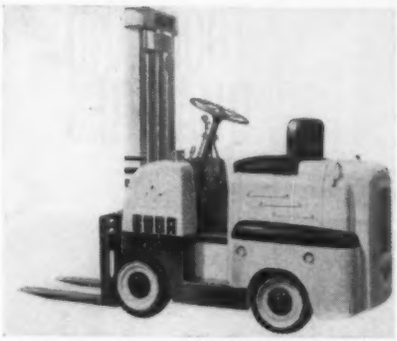


Low-cost testing machine has 120,000 lb capacity

The new Baldwin universal testing machine, model 120-H, with 120,000-lb capacity in tension and compression, has many of the features of larger Baldwin testing machines. The hydraulic loading unit is separate from the indicating and control unit, which isolates recoil from breaking test specimens and permits adjusting maximum or lazy hands with minimum drag. High rigidity is provided in a two-column design with 15-in. clear lateral space between columns. Load is applied upward by an integrated piston and elevating cage consisting of the table, two uprights and upper gripping head, all of which have a 6-in. power stroke. Vertical distance between gripping heads for tension tests or between platens for compression tests may be set anywhere from 1 to 24 in. *Baldwin-Lima-Hamilton Corp.*

For more data insert No. 41 on postcard, p. 121.



Fork trucks embody latest advancements

New Buda safelined designed FT series of fork lift trucks are powered with either a Diesel or gasoline engine. They are available in 12 models on solid or cushion tires in capacities of 3000, 4000, 5000, 6000 and 7500 lb at a 24-in. load center and 4000 lb capacity at an 18-in. load center. Every part and assembly is functional and engineered to meet strict requirements for safety, easy operation, long life, low cost maintenance and less-down-time servicing. Over 85 pct of replaceable parts are interchangeable between all 12 models. Five standard masts provide 72, 84, 108, 114 or 120 in. lift. *Buda Co.*

For more data insert No. 42 on postcard, p. 121.

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Mobile crane

Available in one and two-ton capacities, with low and high mast styles, a hydraulic portable crane is all welded girder type construction with square instead of tubular members. It is operated by a hand pump; offers great stability and maneuverability. Hydraulic lifting mechanism is a single unit pump with variable speed. *Lempco Products, Inc.*

For more data insert No. 43 on postcard, p. 121.

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Valve protection

New valve and flange covers provide protection against leakage without hindering normal operation. Made of Dynel, a fabric resistant to acids and caustics, Chem-Kovers have sufficient strength to contain sprays resulting from gasket or packing failures in pressurized lines. *Mine Safety Appliances Co.*

For more data insert No. 44 on postcard, p. 121.

Combustion boats

Used for holding steel samples during carbon and sulfur determinations, blank-free combustion boats will not crack or burn-through even during high-temperature tests above 2400°F. Preburning is unnecessary. To insure against contamination, Combax boats are untouched by human hands after firing and are sealed without liners in de-greased, unlacquered metal cans. A sample package is available on request. *Fisher Scientific Co.*

For more data insert No. 45 on postcard, p. 121.

Bronze metal hose

Uniflex, a flexible bronze metal hose is seamless and pressure tight. Developed for conveying liquids or gases while withstanding high temperatures, corrosion, and abrasion, it is also a vibration eliminator. Its helical construction distributes the flexing between inner and outer convolutions, allowing greater flexibility and longer life. Uniflex is also produced with a covering of tensile bronze wire braid. *Titeflex, Inc.*

For more data insert No. 46 on postcard, p. 121.

Converging conveyer

A converging section has been added to the line of Sage roller, wheel, and belt conveyers. These units are available for all width roller conveyers from 6 to 36 in. wide. When it is necessary to have two lines converge into one, or one line branch out into two lines, the Convergo Section is effective in handling packages, boxes, cartons and tote-pans and work in process. *Sage Equipment Co.*

For more data insert No. 47 on postcard, p. 121.

Shirt-stud capacitors

A ¼-in. diam ceramic capacitor has new design for coupling UHF circuits in electronic equipment and TV receivers. Capacitance values range to 22 mmf at 500 v dc working. *Sprague Electric Co.*

For more data insert No. 48 on postcard, p. 121.

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Weldit Weldimatic torches are indispensable for defense work production up to 148% plus an average gas saving per operator of $4.80 per day.

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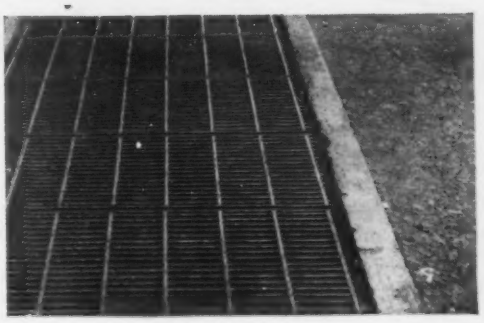

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In prominent steel casting plant, Hendrick heavy-duty grating used for breakout floors has paid for itself many times over in reclaimed sand.

Bearing bars range in size from 2¼" x ⅜" to 4" x ⅜"; cross bars from 2" x 5/16" to 2½" x 5/16"; to meet requirements of loading conditions. Write for complete specifications.

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A.I.S.I.—4130, 4132, 4140, 4150, 8630, E-52100
Stainless Steels:
A.I.S.I.—303, 304, 305, 309, 310, 316, 317, 321, 347, 403, 410, 420, 430, 446, T-5
Nickel Alloys:
Nickel, "D Nickel"*, "L Nickel"*, "K Monel"*, "Monel"*, "Inconel"*, 30% Cupro Nickel, 18% Nickel Silver.
Beryllium Copper.
*Reg. U.S. Trademark International Nickel Company

The HOLE Story —by— Superior

Chapter 1

Shaping a Heart for a Pressure Gauge Requires "Technology in Tubing"

Soon after the tube pictured above comes off the shaping roll, it will be processed into a Bourdon tube, the heart of a pressure gauge, by one of our customers.

The design of a gauge movement and the skill of the gauge builder have a bearing on its accuracy. But nothing can compensate for an irregularly responding Bourdon tube.

That's where Superior comes in. The metallurgy of the tube, its dimensional precision and physical characteristics are all critical . . . and all are rigidly controlled at Superior.

This rigid control is applied to all tubing produced by Superior.

For example, in the production of seamless steel tubing for hydraulic applications, industry standards permit a carbon range of .08 to .18%. This range is not good enough for Superior. Aiming for a carbon content of .12%; Superior Hydraulic Quality tubing is always held to .15% maximum. This insistence on adherence to strict standards applies equally to dimensional tolerances.

Superior produces tubing to rigid specifications year in and year out. We have the engineers, metallurgists, research, production and test facilities that it takes to draw the highest quality small tubing in the widest variety of analyses.

You can call this combination of facilities, men, methods and machines "know-how" . . . or you can call it experience. But whatever you call it the result is always fine small tubing to do a better job for you.

SUPERIOR TUBE COMPANY, 2004 Germantown Avenue, Norristown, Pa.

West Coast: Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif. UNderhill 0-1331.

Inventories Are Growing Fast But Lack Balance

Inventories of some products pushing against permitted limits . . . Other products still very tight . . . Unbalance is widespread . . . Chrome stainless first steel decontrolled.

Steel inventories are growing rapidly. On some products consumers' stocks are pushing against permitted inventory limits. Other products are still in very short supply. Result is that very few consumers have well balanced inventories. It is not uncommon to find a production line slowed for lack of a particular steel item, while incoming shipments of other items threaten to place the firm in inventory violation.

Purchasing agents are going through an intricate juggling act in their efforts to bring inventories into what they feel is a healthy balance. Quick decisions are necessary; buying policy is sometimes changed overnight. In many cases caution is replacing procurement as the key word in buying policy.

Close Scrutiny—There is no question that consumers are paying more attention to their inventories. A few months ago the tendency was to be secretive; today actual inventory position is fairly freely acknowledged.

"Inventory adjustment" is being used more frequently as the reason for cancellation of orders, or for refusal of offers of extra tonnage from mills. Some consumers aren't using all Controlled Materials Plan tickets allotted them. Little talk is heard of inability to get second quarter orders booked. By that time supply is expected to be in pretty good balance with permitted use — provided restrictions on use are not relaxed.

Subject to Change—Steel producers and controls officials are also having a difficult time appraising the market. This is because increasing availability of steel varies not only among products but also among sizes.

Here's how the products shape up now: Cold-rolled sheets and strip, straight chrome stainless, mechanical tubing, silicon sheets, carbon tool steel, and some wire products are fairly easy. Plates, bars, structurals, and hot-topped quality steels are still very tight. Among these, light plates and structurals show signs of easing first.

Save Freight—Another sign of a more balanced market is that consumers are having greater success in placing second quarter orders closer to home. This will eliminate long and costly freight hauls. It will also ease the strain on railroad transportation facilities.

Detroit, historically an area of tightest steel supply, is today one of the softest areas in the market. Almost without exception, auto producers are having brushes with CMP inventory limits. This results from unexpected cutbacks announced for the second quarter.

Not Faded—In this area steel offerings for the second quarter were generally above requirements under scheduled cutbacks. One large consumer was offered 130 pct of its needs. Smaller buyers have picked up most of this tonnage. Auto orders for many grades of steel are off 20 to 30 pct.

Unexpected cutbacks caught some warehouses flat-footed. Last week one house was offering prime sheets practically at mill price. At this level, too, unbalance is more of a problem than too much tonnage.

Another Saving—Profit-wise, lower production volume of auto and appliance companies is being at least partly offset by lower steel costs. Formerly it was necessary to resort to expensive conversion deals to get a large part of their cold-rolled sheets. Now they can usually buy all they are permitted to use close to home. In some cases the saving is $75 a ton or more.

For many manufacturers, copper and aluminum are greater limiting factors than steel. Realizing this, steel consumers are no longer reflecting the procurement urgency of recent months.

Lift Controls—Uncertainty of delivery has caused some steel users to stock more heavily than they would like. Typical of this is a large electrical equipment manufacturer. It says its stocks are within inventory limits, but adds that if it could depend on mill shipments it would operate on a lower inventory.

Now that chrome-stainless has been decontrolled, other spot relaxing of controls may be expected. National Production Authority is conducting a steel inventory survey. And both producers and consumers are urging that controls over some other products be relaxed.

Pressure on Plate—Pressure on plate makers is unrelenting. Another steel committee meeting is scheduled to be held in Washington this week, with the object of finding ways and means to boost plate output. Demand is strongest for heavy plate. With additional shipbuilding expected to be approved as essential, the plate market is expected to remain tight for a long time. Wherever possible, the industry is shifting to plate.

Steelmaking operations this week are scheduled at 100.0 pct of rated capacity, up half a point.

If you want steel

sell Scrap now!

Steel production is at its peak . . . but the scrap that's needed to maintain production is at a new low. Get your iron and steel scrap in now!

For tanks, guns and armored vehicles . . . for all types of civilian uses . . . the nation *needs* steel and the nation is *getting* steel. But steel production is *going to slip* . . . unless you help make more iron and steel scrap available!

The figures tell the story! Each ton of ingot steel requires up to a half-ton of scrap . . . and over 100 million tons of ingot steel are being produced annually. That's why *all* the scrap iron and steel around your plants and yards should be sold now to scrap dealers who will get it moving to the steel mills.

If you use steel—need steel—the surest way of having steel available is to get in your scrap. Start your clean-up drive today!

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION

Market Briefs

big press — Two large aluminum companies have announced installation of giant extrusion presses under auspices of the U. S. Air Force press program. Aluminum Co. of America is installing a 13,200-ton press at its Lafayette, Ind., Works. Reynolds Metals Co. has received a multi-million dollar Air Force contract for a new building and two new presses at its Phoenix plant. Larger of the presses will have a capacity of 12,000 tons, the smaller, 8000.

flood hits steel—Flood waters in western Pennsylvania, Ohio, and West Virginia caused some loss of steel production. At the Steubenville, Ohio, plant of Wheeling Steel Corp., at least 48 hours production of ten openhearths and two blast furnaces was lost. Another blast furnace at Bendwood, W. Va., plant was down for a similar period. Nearly 24 hours production was lost at the Duquesne Works of U. S. Steel Co., affecting 23 openhearth furnaces.

strikes end— Wage disputes in Mobile's three shipyards finally have been settled. Recently 2000 employees of the Alabama Dry Dock & Shipbuilding Co. ended a 167-day strike after a satisfactory wage scale was agreed upon. But a few days later employees of the Gulf Shipbuilding Co. and the repair division of Waterman Steamship Line walked out. These strikes were ended this week when an increase of 14¢ per hr was accepted.

furnace trouble — One of Bethlehem Steel Co.'s three blast furnaces at Steelton, Pa., is giving trouble. First noticed Jan. 18, the lining at the top seems to be going. The furnace is still hobbling along but it may have to be blown out for repairs at any moment. If the trouble is confined to the top repairs will take only a couple of weeks—if it needs a complete relining the furnace will be down for about 6 weeks.

new furnace — Rust Furnace Co. will build a new continuous slab heating furnace for The Steel Co. of Canada, Ltd. at Hamilton, Ont. The furnace will increase productive capacity of hot-rolled strip by approximately 100 pct. Rated capacity will be 110 tons per hour.

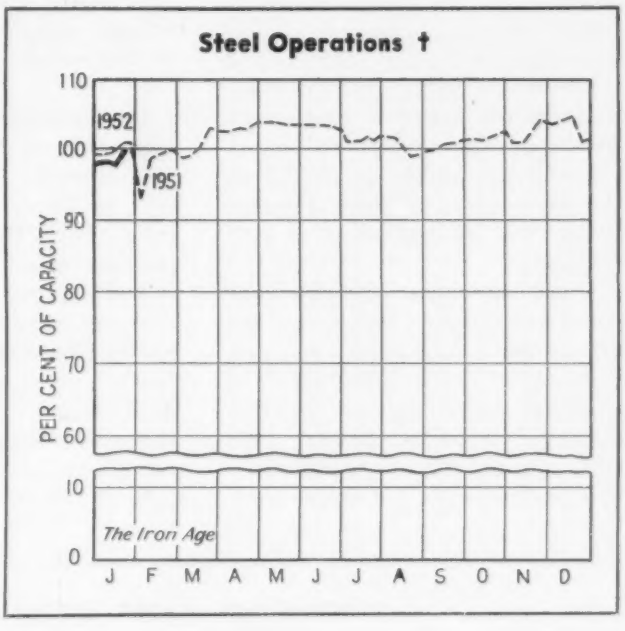
zinc shortage —A top Defense Production Administration official said this week that the outlook for zinc for both this year and next remains dark. While there will be an increase for civilian production, there still won't be enough to go around. Meanwhile DPA has set 1,320,000 short tons as the supply goal for 1955. Of this figure, imports would be relied upon for 403,000 tons.

detinning— Weirton Steel Co. has started up its new detinning plant—first in the industry—with a recovery capacity of 300,000 lbs of tin and 30,000 tons of high quality steel scrap per year. Facilities include detinning, rinse and precipitation tanks, filters, furnaces, a scrap bundling press and auxiliary equipment. Raw material for the detinning plant will consist mainly of scrap produced in operation of the company's tin mills. Some tin plate scrap will be bought from the outside.

expansion — Bloom Engineering Co., Pittsburgh, producers of fuel burners and combustion equipment for steel mill and industrial furnaces, has been granted a certificate of necessity for a new building already under construction.

British prices up— Export prices of British heavy steel products have been raised $12.50 per net ton. Prices of other steel products still run below those on the European mainland.

more pig iron—The government of India is considering building new blast furnace capacity. The country wants at least an additional 350,000 tons of pig iron per year.



District Operating Rates—Per Cent of Capacity †

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	West	Buffalo	Cleveland	Detroit	Wheeling	South	Ohio River	St. Louis	East	Aggregate
Jan. 20	99.0	101.5*	102.0	100.0	99.0	104.0	101.5	108.0*	102.0	104.0	93.0	85.1	103.5	99.5
Jan. 27	101.0	101.5	101.2	100.0	96.0	104.0	101.0	106.0	102.0	104.0	99.5	86.5	103.5	100.0

† Beginning Jan. 1, 1952, operations are based on annual capacity of 108,587,670 net tons.
* Revised.

OPS Raises Concentrate Prices

Zinc and lead increase of 2¢ on materials not lifted last Oct. 2 . . . Wage dispute sent to WSB . . . Aluminum Ltd. plans alumina boost . . . World tin prices up—*By R. L. Hatschek.*

Office of Price Stabilization last week brought itself up to date by allowing a 2¢ per lb increase in the price of metal contained in domestic lead and zinc ores and concentrates. The boost is retroactive to Oct. 2, 1951, when lead and zinc metal prices went up by the same amount. The idea, of course, is to make production more attractive to marginal and sub-marginal mines and so increase total production of these metals.

Residues, skimmings and the like will also be allowed the increase but other items which were raised last October will not reflect this latest price action.

Threats Work—Last week THE IRON AGE reported that the main objective of the aluminum strike threat against Aluminum Co. of America and Kaiser Aluminum & Chemical Co. was to get the Wage Stabilization Board to hold aluminum hearings. President Truman referred the matter to WSB over the week end and three separate panels will be conducting investigations.

Work stoppages affecting both Alcoa and Kaiser plants across the nation were scheduled for early February by United Steelworkers of America and Aluminum Workers Council. Reynolds Metals Co.'s labor contract runs to April so they weren't threatened. Average hourly wages paid by Alcoa reportedly range from $1.18 in Arkansas to $1.45 in Detroit.

Tariff Bills Delayed—Two Nevada Senators, Pat McCarran and George Malone, have stalled the lead and zinc import tariff suspension bills already passed by the House. About a 2-week delay was asked, presumably for further study of the measure.

No Price Boost—Flow of copper scrap is substantially below what the government thinks it ought to be and with industry scrap stocks at a low point it is vital that the pipeline be kept full. Defense Mobilizer Charles Wilson last week acted to squelch the hopes of speculating scrap dealers. He absolutely denied the possibility of an increase in scrap copper prices.

Up Alumina Plans—A 150 pct expansion is set for plans of Aluminum Limited alumina facilities in Jamaica. Original plans called for 200-ton-a-day production and this has been stepped up to 500 tons with successive development to bring the plant's capacity to 740 tons daily. Production of alumina in Jamaica will slice freight costs in half for the raw material going to new Canadian plants—mainly Kitimat.

Work is well under way and first production of alumina is scheduled for the third quarter with total expanded facilities (500 tons per day) coming into the picture late in 1953, ready for Kitimat to begin operations early in 1954.

Raise Ingot Prices—One of the first results of Reconstruction Finance Corp.'s recent action in raising the tin price to $1.21½ per lb is an increase in the prices of brass ingot containing tin. Prices in the 88-10-2 group were lifted from ½¢ to 3¼¢ per lb and in the 80-10-10 group they were raised from ¼¢ to 2½¢.

Tin and tin containing scrap also went up in price following the RFC increase. Block tin, pewter, babbitt, solder joints, and the like are all higher this week.

Optimistic on Bolivia Tin—It is expected in Washington that the next tin contract discussions will be with Indonesia. Stuart Symington is expected to figure in these negotiations as his last tin act while head of RFC. Then, when a new administrator is chosen, it is anticipated that the Bolivian talks will be resumed.

Both the London and Singapore markets have been rising since it was formally announced that Great Britain would supply tin to the U. S. Last Thursday the London market took a substantial jump, leading to speculation that the British government has already started bidding for metal destined for this country, and the Singapore price followed on the day after. Closing price at London was $1.25¼ on Friday and the ex-smelter price in Singapore was about $1.21¾, equivalent to $1.25¼ c.i.f. New York.

Correction — Last week's price box erroneously showed the delivered price of Lake copper at 23.625¢ on Jan. 21 and 22.625¢ on Jan. 22. Both should have been 24.625¢.

NONFERROUS METAL PRICES

	Jan. 23	Jan. 24	Jan. 25	Jan. 26	Jan. 28	Jan. 29
Copper, electro, Conn.	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake delivered	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.215	$1.215	$1.215	....	$1.215	$1.215
Zinc, East St. Louis	19.50	19.50	19.50	19.50	19.50	19.50
Lead, St. Louis	18.80	18.80	18.80	18.80	18.80	18.80

Note: Quotations are going prices.

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.188 in., 2S, 3S, 30.1¢; 4S, 61S-O, 32¢; 52S, 34.1¢; 24S-O, 24S-OAL, 32.9¢; 75S-O, 75S-OAL, 39.9¢; 0.081 in., 2S, 3S, 31.2¢; 4S, 61S-O, 33.5¢; 52S, 35.6¢; 24S-O, 24S-OAL, 34.1¢; 75S-O, 75S-OAL, 41.8¢; 0.032 in., 2S, 3S, 32.9¢; 4S, 61S-O, 37.1¢; 52S, 39.8¢; 24S-O, 24S-OAL, 41.7¢; 75S-O, 75S-OAL, 52.2¢.

Plate ¼ in. and heavier: 2S, 3S-F, 28.3¢; 4S-F, 30.2¢; 52S-F, 31.8¢; 61S-O, 30.8¢; 24S-O, 24S-OAL, 32.4¢; 75S-O, 75S-OAL, 38.8¢.

Extruded Solid Shapes: Shape factors 1 to 5, 36.2¢ to 74.5¢; 12 to 14, 36.9¢ to 89¢; 24 to 26, 39.6¢ to $1.16; 36 to 38, 47.2¢ to $1.70.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 37.5¢ to 39.5¢; cold finished, 0.375 to 3 in., 2S-F, 3S-F, 40.5¢ to 35¢.

Screw Machine Stock: Rounds, 11S-T3, ⅛ to 11/32 in., 53.5¢ to 42¢; ⅜ to 1½ in., 41.5¢ to 39¢; 1 9/16 to 3 in., 38.5¢ to 36¢; 17S-T4 lower by 1.5¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 39.5¢ to 29¢; 52S, 48¢ to 35¢; 56S, 51¢ to 42¢; 17S-T4, 54¢ to 37.5¢; 61S-T4, 48.5¢ to 37¢; 75S-T6, 84¢ to 67.5¢.

Extruded Tubing, Rounds: 63-S-T-5, OD in in.: 1¼ to 2, 37¢ to 54¢; 2 to 4, 33.5¢ to 45.5¢; 4 to 6, 34¢ to 41.5¢; 6 to 9, 34.5¢ to 43.5¢.

Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., $1.42; 96 in., $1.522; 120 in., $1.902; 144 in., $2.284. Gage 0.24 x 28 in., 72 in., $1.379; 96 in., $1.839; 120 in, $2.299; 144 in., $2.759. Coiled Sheet: 0.019 in. x 28 in., 28.2¢ per lb; 0.024 in. x 28 in., 26.9¢ lb.

Magnesium

(F.O.B. mill, freight allowed)

Sheet and Plate: FS1-O, ¼ in., 63¢; 3/16 in., 65¢; ⅛ in., 67¢; B & S Gage 10, 68¢; 12, 72¢; 14, 78¢; 16, 85¢; 18, 93¢; 20, $1.05; 22, $1.27; 24, $1.67. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., ¼ to 0.311 in., 74¢; ⅜ to ¾ in., 57.5¢; 1¼ to 1.749 in., 53¢; 2½ to 5 in., 48.5¢. Other alloys higher. Base up to ¾ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated, 0.10 to 0.11 lb, 3.5 in., 62.3¢; 0.22 to 0.25 lb, 5.9 in., 59.3¢; 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.8 to 2.59 lb, 19.5 in., 53.8¢; 4 to 6 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb, ½ to 1.80 lb, 20,000 lb; 1.80 and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057; ¼ in. to 5/16, $1.40; 5/16 to ⅜, $1.26; ½ to ⅝, 93¢; 1 to 2 in., 76; 0.165 to 0.219, ⅝ to ¾, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb.; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

Nickel and Monel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold-rolled	77	60½
Strip, cold-rolled	83	63½
Rods and bars	73	58½
Angles, hot-rolled	73	58½
Plates	75	59½
Seamless tubes	106	93½
Shot and blocks	..	53½

Copper, Brass, Bronze

(Freight prepaid on 200 lb)

	Sheet	Rods	Extruded Shapes
Copper	41.68	....	41.28
Copper, h-r	....	37.53	....
Copper, drawn	....	38.78	....
Low brass	39.67	39.36	....
Yellow brass	38.28	37.97	....
Red brass	40.14	39.83	....
Naval brass	43.20	37.26	38.52
Leaded copper	....	41.58	....
Com'l bronze	41.13	40.82	....
Mang. bronze	46.92	40.81	42.37
Phos. bronze	61.07	61.32	....
Muntz metal	41.18	36.74	37.99
Ni silver, 10 pct	49.82	52.04	....

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	19.00
Aluminum pig	18.00
Antimony, American, Laredo, Tex.	50.00
Beryllium copper, 3.75-4.25% Be	1.56
Beryllium aluminum 5% Be, Dollars per lb contained Be	$69.00
Bismuth, ton lots	$2.25
Cadmium, del'd	$2.55
Cobalt, 97-99% (per lb)	$2.40 to $2.47
Copper, electro, Conn. Valley	24.50
Copper, Lake, delivered	24.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium dollars per troy oz.	$200
Lead, St. Louis	18.80
Lead, New York	19.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb.	24.50
Magnesium, sticks, 100 to 500 lb.	42.00 to 44.00
Mercury, dollars per 76-lb. flask, f.o.b. New York	$206 to $209
Nickel electro, f.o.b. N. Y. warehouse	59.58
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	52.75
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$90 to $93
Silver, New York, cents per oz.	88.00
Tin, New York	$1.215
Titanium, sponge	$5.00
Zinc, East St. Louis	19.50
Zinc, New York	20.20
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot	
No. 115	27.25
No. 120	26.75
No. 123	26.25
80-10-10 ingot	
No. 305	33.00
No. 315	30.50
88-10-2 ingot	
No. 210	41.50
No. 215	40.00
No. 245	34.50
Yellow ingot	
No. 405	23.25
Manganese bronze	
No. 421	30.50

Aluminum Ingot

(Cents per lb, 10,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	20.6
0.60 copper, max.	20.4
Piston alloys (No. 122 type)	21.2
No. 12 alum. (No. 2 grade)	19.5
108 alloy	20.6
195 alloy	20.8
13 alloy	20.8
ASX-679	20.5

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	18.80
Grade 2—92-95%	18.60
Grade 3—90-92%	18.40
Grade 4—85-90%	18.20

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	37.34
Electrodeposited	33¾
Flat rolled	38.34
Forged ball anodes	43
Brass, 80-20	
Cast, oval, 15 in. or longer	34¾
Zinc, oval	26½
Ball anodes	35½
Nickel 99 pct plus	
Cast	76.00
Rolled, depolarized	77.00
Cadmium	$2.80
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	97½

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	20½
Nickel chloride, 375 lb drum	27½
Silver cyanide, 100 oz lots, per oz	67¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	47.7

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	21½	20¾
Yellow brass	19½	17⅞
Red brass	20½	19⅝
Comm. bronze	20½	19⅝
Mang. bronze	18½	17⅝
Brass rod ends	18⅞	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
Refinery brass	17.25*
Radiators	14.75

* Dry copper content.

Ingot Maker's Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
No. 1 composition	18.50
No. 1 comp. turnings	18.25
Rolled brass	15.50
Brass pipe	16.50
Radiators	14.75
Aluminum	
Mixed old cast	9.75
Mixed new clips	11.00
Mixed turnings, dry	9.50
Pots and pans	9.25

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	18¾—19⅛
No. 2 heavy copper and wire	17¼—17⅝
Light copper	16 —16½
New type shell cuttings	16 —16½
Auto radiators (unsweated)	14¼—14⅝
No. 1 composition	18 —18½
No. 1 composition turnings	17¾—18
Unlined red car boxes	16¾—17¼
Cocks and faucets	15½—16
Mixed heavy yellow brass	12 —12½
Old rolled brass	15 —15½
Brass pipe	16 —16½
New soft brass clippings	16 —16½
Brass rod ends	15½—16
No. 1 brass rod turnings	15 —15½
Aluminum	
Alum. pistons and struts	6½— 7½
Aluminum crankcases	7½— 8
2S aluminum clippings	10½
Old sheet and utensils	7½— 8
Borings and turnings	5 — 6
Misc. cast aluminum	7½— 8
Dural clips (24S)	7½— 8
Zinc	
New zinc clippings	13¼—13½
Old zinc	10 —10¼
Zinc routings	6¾— 7
Old die cast scrap	6¾— 7
Nickel and Monel	
Pure nickel clippings	35 —36
Clean nickel turnings	35 —36
Nickel anodes	35 —36
Nickel rod ends	35 —36
New Monel clippings	28 —29
Clean Monel turnings	20 —21
Old sheet Monel	28 —29
Nickel silver clippings, mixed	13 —14
Nickel silver turnings, mixed	12 —13
Lead	
Soft scrap, lead	15¾—16
Battery plates (dry)	10 —10½
Batteries, acid free	7 — 7¼
Magnesium	
Segregated solids	15 —16
Castings	14 —15
Miscellaneous	
Block tin	100 —110
No. 1 pewter	80
No. 1 auto babbitt	60
Mixed common babbitt	16¼—16½
Solder joints	22 —23
Siphon tops	60
Small foundry type	21 —22
Monotype	18½—19
Lino. and stereotype	17½—18
Electrotype	16 —16½
Hand picked type shells	10 —11
Lino. and stero. dross	8¾— 9
Electro. dross	7½— 8

Whipping Post Rips Cars Asunder

Crane slams auto wrecks against steel post . . . Upholstery flies out, chassis falls apart, "guts" usually drop out . . . Burners must still follow up operation for minor cutting.

While many community leaders are properly sympathetic to the scrap collection cause, they have not been able to sway their civic consciences to permit a temporary return to the old way of burning the soft stuff out of wrecked autos —pouring on the kerosene and letting the flames do an inexpensive but smoky job.

Some large cities have proposed incinerator systems and have specified car burning procedures. But the auto graveyard still needs a cheap way to strip the rubber and upholstery out of its bodies.

A "whipping post" operation was witnessed by THE IRON AGE last week in the Columbus, Ohio, yards of the Goodale Auto Parts Co. Clearing a portion of its yard to make room for the type of incinerator now specified by Columbus edict, Goodale's J. N. Miller conceived the idea of a crane picking up a jalopy by its tail (bumper) and whipping it several times against a heavy steel post mounted on a 3-ton metal base.

The jalopy is soon reduced to chassis shell without any precutting. Most burnable material flies off and usually the motor and transmission drop out by the time the body shell has been torn loose. Goodale considers this rough-and-ready process simpler and less expensive than incineration according to law.

Two burners take over after the "whipping", cutting sections of the chassis and sorting the steel from the iron. Mr. Miller who operates the Goodale crane can smash better than six cars per hr. In many yards it takes three men to dismantle about two cars an hr—not counting cutting time.

The 7-ft tall post is a heavy steel shaft with two cross arms welded to the top. The arms hook sections of the chassis while the crane tugs.

Pittsburgh—Scrap was in no better supply this week than last. But the situation appeared to be improved through better distribution. Allocations have helped U. S. Steel Co. pick up "a few days" inventory and restore three of five openhearths to production. Consumers generally continued pessimistic.

Chicago — Scrap situation remains virtually unchanged. Three of five local mills are reported getting allocations. Foundries also are pushing hard to get deliveries of allocations. Supplies of railroad scrap are still being hurt by deep snows in remote parts of the country which immobilize the scrap. Some mills are getting scrap from Texas.

"WHIPPING": Car smashed against post.

Philadelphia—There is little change from last week though rainy weather has hampered outdoor yard activities. Inventories are still low but there seems to be little danger of immediate shutdowns. Foundries are melting about 25 pct pig iron and 75 pct scrap—not up to normal but far better than last year when some were on a 100 pct scrap charge.

New York—The heavy scrap picture remains about the same. Cast iron demand has fallen sharply. Foundry stocks are reported high. Shipments are being held up and in some cases foundries have slipped out of the buying picture. OPS is still working with scrap people on simplification of electric furnace and foundry grades.

Detroit—The local scrap market is quiet this week. Informed sources see no serious present threat to a continued high operating rate at Detroit. January shipments seem to have picked up somewhat, due primarily to more favorable weather conditions.

Cleveland—Scrap picture here is growing bleaker. One mill has less than 2 days' supply. The Ohio River flood may divert some scrap to here.

St. Louis—Movement of scrap to mills is improved as the weather moderates. Allocations are increasing, but are generally specifying more than the dealers can possibly deliver immediately.

Birmingham—The steel scrap situation here is easier this week than in many months. One broker said he has more "free" scrap than he has had since early last year and is taking care of regular customers who have been suffering. Heavy melting and electric furnace grades are both being received. Cast scrap prices are being cut by some dealers.

Cincinnati—Good weather had helped movement of out-of-state scrap into this area but current flood conditions are shutting down some scrap yards. About 75 pct of tonnage moving is on allocation. Trucking scrap to Armco at Middletown has been halted.

Boston — Movement of materials here has slowed down appreciably because of cold weather, shortage of freight cars.

Buffalo—While leading mills showed a stockpile improvement because of allocations, near zero temperatures have interrupted flow of scrap here. A substantial tonnage is moving out of the area under directives.

Nuts, Semi-Finished—Hexagon

	Reg.		Hvy.	
⅜ in. & smaller.	35	45	28½	39½
7/16 in. & ½ in.	29½	40½	22	34
⅝ in. to 1½ in. inclusive	24	36	15	28½
1⅝ in. & larger.	13	26	8½	23
	Light			
7/16 in. & smaller	35	45		
½ in. thru ⅝ in.	28½	39½		
¾ in. to 1½ in. inclusive	26	37		

Stove Bolts

Pot Off List

Packaged, steel, plain finished. 48—10
Packaged, plate finish. 31—10
Bulk, plain finish** 62*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets

Base per 100 lb

½ in. & larger. $7.85

Cap and Set Screws

(In bulk) *Pot Off List*

Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright 54
¼ in. thru 1 in. up to & including 6 in. 43
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat 46
¾ in. thru 1 in. up to & including 6 in. 41
Milled studs 35
Flat head cap screws, listed sizes 16
Fillister head cap, listed sizes 34
Set screws, sq head, cup point, 1 in. diam. and smaller x 6 in. & shorter 53

FERROALLOYS

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.
High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.
Carloads 21.60
Ton lots 23.75
Less ton lots 25.25
Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.
Carloads 27.75
Ton lots 30.05
Less ton lots 31.85

Ferromanganese

78-82% Mn. maximum contract base price, gross ton, lump size.
F.o.b. Niagara Falls, Alloy, W. Va., Ashtabula, O. $185
F.o.b. Johnstown, Pa. $187
F.o.b. Sheridan, Pa. $185
F.o.b. Etna, Clairton, Pa. $183
$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%.
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.
Carload, bulk 10.95
Ton lots 12.55

Spiegeleisen

Contract prices gross ton; lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$74.00	$75.00
Pgh. or Chicago	76.00	76.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.
96% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.
Carload, packed 34.75
Ton lots 36.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.
Carloads 28
Ton lots 30
Less ton lots 32

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb. of contained Mn. 19.15¢

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.
Carload bulk 9.90
Ton lots 11.55
Briquet, contract basis carlots, bulk delivered, per lb of briquet 11.15
Ton lots 12.75

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $92.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $90.00. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.
96% Si, 2% Fe 21.70
97% Si, 1% Fe 22.10

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.
Carload, bulk 6.95
Ton lots 8.55

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	14.30
50% Si	12.40	85% Si	15.55
90-95% Si	17.50		

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.7% max. C, 0.06% P, 90% Mn	26.25	28.10	29.30
0.07% max. C	25.75	27.60	28.80
0.15% max. C	25.25	27.10	28.30
0.30% max. C	24.75	26.60	27.80
0.50% max. C	24.25	26.10	27.30
0.75% max. C, 7.00% max. Si	21.25	23.10	24.30

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.
Carload 9.90¢
Ton lots 11.30¢

Calcium molybdate, 46.3-46.6%, f.o.b. Langeloth, Pa., per pound contained Mo. $1.15

Ferrocolumbium, 50-60%, 2 in. x D, contract basis, delivered, per pound contained Cb.
Ton lots $4.90
Less ton lots 4.95

Ferro-Tantalum-columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta $3.75

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo $1.32

Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton $65.00
10 tons to less carload 75.00

Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots 1.55

Ferrotitanium, 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $177.00

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered $5.00

Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.
Openhearth $3.00-$3.10
Crucible 3.10- 3.20
High speed steel (Primos) 3.20- 3.25

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b. Langeloth, Pa. $1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.13

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound
Carload, bulk lump 14.50¢
Ton lots, bulk lump 15.75¢
Less ton lots, lump 16.25¢

Vanadium pentoxide, 86-89% V_2O_5 contract basis, per pound contained V_2O_5 $1.33

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
Ton lots 11.00¢

Zirconium, 12-15% contract basis, lump, delivered, per lb of alloy.
Carload, bulk 7.00¢

Boron Agents

Contract prices per lb of alloy, del. Borosil, f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B $5.25

Bortam, f.o.b. Niagara Falls
Ton lots, per pound 45¢
Less ton lots, per pound 50¢

Corbortam, Ti, 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.
Ton lots, per pound 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots $1.20
F.o.b. Wash., Pa.; 100 lb up
10 to 14% B .85
14 to 19% B 1.20
19% min. B 1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.
No. 1 $1.00
No. 6 68¢
No. 79 50¢

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe. 1.50% max. Si. 3.00% max. C, 2 in. x D, del'd
Ton lots $1.44
Less ton lots 1.57

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.
Less ton lots $1.30

Silcaz, contract basis, delivered.
Ton lots 45.00¢

CONSIDER GOOD USED EQUIPMENT FIRST

AIR COMPRESSORS
Ingersoll Rand 33" x 20½" x 24", Complete with 635 H.P. G.E. Syn. Motor 2300/3/60
2873 cu. ft. Worthington 29" x 21" & 18½" x 21". Complete with Elec. Equipment

BENDING ROLL
No. 6 Hilles & Jones Pyramid Type Plate Bending Roll, Capacity 16' x ¾" Plate Complete with Electrical Equipment

BULLDOZER
#9 William White Bulldozer, Motor Driven With 50 H.P. Motor

CRANE—GANTRY
5 ton Whiting Two Leg Gantry 52" Span, Three Motors 220/3/60, Cab Control

CRANE—TROLLEY
40 Ton Shaw-Box Trolley, Equipped with 15 H.P. G.E. Motor. Gauge of Trolley 7'6". Lift 80'. New 1942

FLANGING MACHINES
¾" McCabe Pneumatic Flanging Machine, Pneumatic Holddowns, Circle Flanging Attachment and numerous dies
No. 3 Blue Valley Flanging Machine. Will flange flat heads from 48" to 10' or 12' dia. Silent chain drive with A.C. Motor. Equipped with air cylinder and hydraulic pump

FORGING MACHINE
2" AJAX Upsetting and Forging Machine

FURNACES—MELTING
400 lb. Moore Type "UT" Melting Furnace Top Charge. Complete with Transformer. New 1943—Little used.
15 ton Heroult Model V-12 Electric Melting Furnace, Top Charge hydraulically operated. Complete with Transformer Equipment

HAMMER—STEAM FORGING
6000 lb. Chambersburg Steam Forging Hammer Guided Ram, 21" Bore, 60" Stroke

PLANERS
48" x 48" x 12' Niles-Bement-Pond, Four Head
60" x 60" x 12' Niles-Bement-Pond, Four Head
72" x 72" x 12' Niles-Bement-Pond, Four Head

PLATING PLANT
Crown Automatic Nickel & Chrome Plating Unit, 48" Depth of Tanks, Complete with Plating Solution Tester, Generator, Rectifier, Pump all Elecl. Equip., etc.

PRESS—HYDRAULIC FORGING
1000 Ton United Steam Hydraulic Forging Press Quick Acting Stroke (Daylight) 4', Distance Between Columns FtoB 31", RtoL 72" Intensifier and Accumulator included, also 8000 lb. Alliance Straight Line Manipulator. NEW 1942

ROLLING MILLS
12½" x 16" Philadelphia Two High Cold Rolling Mill, Complete with Pinion Stand, 75 H.P. Motor 440/3/60, Starter and Controls, Incl. Coiler
18" x 24" Waterbury Farrel Two Stand Two High Rolling Mill, Complete with Elec. Equip.

STRAIGHTENERS
No. 6 Kane & Roach 8-Roll Bar, Angle & Shape Straightener, Motor Driven. Capacity 5 x 5 x ⅝" Angles, 6" x 1" Flats, 2¾" Square, etc.
No. 4 Kane & Roach 8-Roll Bar, Angle & Shape Straightener, Belt Driven. Capacity 3 x 3 x ⅜" Angles, ¾ x 2½" Flats, 2" Square, etc.
7-Roll DECo Shape Straightener, Arr. Geared Motor Drive. Capacity ¾ x ¾ x ⅛" to 1½ x 1½ x 3/16" Angles, ⅜ x 3" Flats, also bars, channels, beams, etc.

TESTING MACHINES
10,000# Olsen Universal Wire Testing Machine
20,000# Southwark S10C Universal Hydr. Testing Machine
120,000 lb. SOUTHWARK-TATE-EMERY Universal Hydraulic Testing Machine LATE
300,000 lb. SOUTHWARK-EMERY Universal Hydraulic Testing Machine

UNIVERSAL IRONWORKER
No. 7 Ryerson Kling Universal Ironworker with Coper. Capacity Punch 1 5/16" thru 1", Shear ¾" Plate, 2¼" Round, 2" Square, 6x6x½" Angles, Complete with Elecl. Equip.

WELDERS
700 KVA Federal Flash Welder, Enclosed Rim Type, 440 Volt, Single Phase, Ring Sizes 6" to 35" Diameter x 12" Wide
40 KVA Sciaky, Spot Welder, 36" Throat 440/3/60 operation

RITTERBUSH & COMPANY INC.
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The Clearing House

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Reserve Tools—Machinery Dealers National Assn. will study the problem of what to do with surplus machine tools after accelerating defense production tempo tapers off. The volume of machine tools that may gradually become surplus may be staggering, some of the trade feel.

As after World War II it will again be impossible for a more normal market to absorb such a mass of tools, being freed in a comparatively short time. The alternative last time was storing these machines in military reserve pools or in defense plants that became standby.

This time MDNA will probably make some provision for more careful packing away of this valuable equipment. Although some dealers feel that storing away these surplus tools is inevitable, they don't like to think of late model tools being released to industry when for emergency reasons output is given a real stimulus—not while the trade remains outside these negotiations. Dumping reserve tools saps the used market.

Directors' Meeting—MDNA will hold a directors' meeting on Feb. 6 in St. Louis. They will, of course, discuss amendments to CPR 80. Another topic that has been drawing attention in Washington may also be on the agenda—the reconditioning clause in CPR 80.

American Rebuilders Assn. has been hammering away at the reconditioning clause as unsatisfactory. MDNA, however, contends that the clause is tightly written—too tightly, some dealers say. Since OPS is not empowered to alter traditional marketing procedures, MDNA feels that it has no right to alter reconditioning practices.

However, some changes may be forthcoming in the clause.

Foreign Tools—Used machinery dealers who historically imported new machine tools from Europe have had a greatly enlarged European productive capacity to draw from. Quality of foreign tools has improved considerably and shorter delivery dates have made these tools an attractive buy for defense industries. Aircraft firms and some large manufacturers converting to defense have been principal purchasers.

Recently a $2 million order for European radial drills was reported. Italy's machine tool industry has made rapid progress, as have those of Germany, France, and England.

Inquiries Quieter — Detroit volume of inquiries seems to be leveling off, reflecting to some extent the progress that is being made in tooling for defense. Production of defense items alone is expected to keep demand for good used machine tools at a comparatively high level for many months. Greater spread of subcontracting may bring out many more small plants into the market.

Paradoxically, used machinery dealers are suffering from a serious manpower shortage while unemployment in Detroit rises. Rebuilders need men with more than assembly line skills and finding them is not simple.

Manpower — Some have instituted employee training programs in anticipation of a more critical labor shortage when defense really gets rolling. Other Detroit dealers are taking the tack that they will zealously guard their working staff and increase working hours when the pinch is on. Some are determined to stave off the impulse to expand facilities.

Trade sources report no major examples in which defense programs have been cut back after reaching scheduled production. This is a worry that has been nagging both new and used machinery dealers.